

**Friends of the Insane
and Other Essays**

BAYARD HOLMES



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THE FRIENDS OF THE INSANE
THE SOUL OF MEDICAL EDUCATION
AND OTHER ESSAYS

BY
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1911 PREFACE.

The following essays are corrected reprints from the pages of the *Lancet-Clinic*. Some brief additions have been made to them for completeness or clearness. They were written with a distinct purpose.

It has seemed very unreasonable, not to say cruel, that the insane are cared for by the State, not for their own good, but, as Dr. George Webster, President of the Illinois State Board of Health once said at a banquet of a medical fraternity, for the good and safety of the sane. Millions are spent in custody, but not a dollar in cure, not a dollar in research. If the man of business, the stock farmer, for example, lost one out of every 300 of his creatures by an expensive disease or accident, and continued caring for these sick animals at great expense, making no effort to discover the source of the disease or do away with the cause of the accident, he would be in the position of the forty sovereign States that care for the insane but make no effort to discover and eradicate the cause.

For every thousand dollars spent in custody ten dollars ought to be spent in research. Economy might dictate that even a hundred dollars out of each thousand should be spent in research and cure. As it is, absolutely no effort is made by any department of State to shut off the need of an expense for custody of the insane, which is as much a burden to industry as a perpetual war.

It is my belief that this work of investigating the causes of insanity should be carried on by the university. The problem seems to be one of biologic chemistry. The chemical libraries and trained chemists and biologists are already crowded about the university. The precedent of associating the agricultural experimental stations with the State university has opened the way, and the prospect of great economic benefit to the State has been demonstrated by the work of the Department of Agriculture. If the various departments of State charity and correction could be under the scrutiny of a scientific body of imaginative investigators, the need of many millions for custody and correction could be eliminated (Rhodes).¹

The insane themselves cannot, for various and obvious reasons, present their claims.² The friends of the insane have never been organized for their own protection, education and consolation. There seems to be a strange isolation in the fact of insanity in the household. For death and for the bereaved by death there is ostentatious sympathy and consolation from friends and strangers and the world of literature. For the bereaved by insanity there is a fateful silence and turning away. There is every reason why the friends of the insane should be thoroughly organized into a great executive and educational body. The commitment of the insane is in many States a relic of barbaric legal procedure and should be corrected. In

1 Rhodes: Internationaler Kongress für Irrenpflege. Wien, Oct., 1908. Offizieller Bericht.

2 Beers, C. W.: A Mind that Found Itself. Macmillan & Co., 1908. 8vo, pp. 363.

every State the custody of the insane is conducted under ideal conditions for the promotion of tuberculosis. There is no State institution where adequate encouragement is provided for the study of the causes of insanity or of the conditions of parasitism, hemology, nutrition and metabolism during the course of the disease. There is no State in which the insane are available for demonstration to medical societies and medical students. The ordinary means of studying insanity, which medical men have in studying all other diseases, is taken away from the medical profession by law, and no other provisions are made at all commensurate with the importance and the complexity of the problem.

The problem of the insane is intricately associated with the problems of crime, prostitution and poverty, as well as with the problems of hospital management, education and all political economies. A considerable proportion of the insane first manifest their disease by acts that bring them into conflict with the police. The courts should be provided by the friends of the insane with a questor or advocate for the insane, whose duty it should be to call the attention of the court to such evidence as might early lead to the treatment of cases of incipient insanity, such as the State now provides, and thus save the judiciary from the bungling decisions which so often confound the officers of penal institutions. If an organization of the friends of the insane did nothing more than provide an advocate for the insane in criminal courts and police courts, the reason for such an organization would soon be ad-

mitted by all whose complacency would be disturbed by the innovation.

When insanity comes to a household, there is nothing that is too expensive to be undertaken. The private sanitarium is recommended by alienists because the family dread and are terrified by the State institutions. The expense at these private places is very high—fifty to two hundred dollars a week. Nothing commensurate with the price is, however, furnished. The attendants work for fifteen to thirty dollars a month. There are no laboratories, baths or skilled attendants. The folks who look upon surroundings of luxury as more important than the researches which reason dictates will always patronize these places, where brass door knobs and Brussels carpets take the place of bolts and bare floors. If a small part of the largess poured out on the unsanitary, unnecessary and unappreciated display of the private mad-houses was devoted to research, something could be accomplished by private initiative, and that promptly. It should be the duty of an organization of the friends of the insane to warn any but the very rich against the private sanitarium, and dissuade them from their prejudices against the State institutions.

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INSANITY

THE FRIENDS OF THE INSANE.

THE FRIENDS of the insane are in a most pitiable condition. The event of insanity in the family is unprecedented and unprovided for. The doctor is called, and he, too, is "up against it." He knows as well as the family that the boy is crazy. More than this he knows no better than they. He calls a psychiatrist, whose complete armamentarium consists of a percussion hammer, a pair of dividers and a glass tube. He gives a name to the disease, itself most ominous, a shadow of prognosis, recommends an expensive private sanitarium, collects an unequalled fee, and complacently departs.

If the patient must be legally committed, another horror is added to the natural anguish consequent to the disease. The distracted patient must be brought to court, and from that time until the doors of the madhouse close upon him he is in the hands of the sheriff and in the position of a convict, frequently handcuffed to an, at best, ignorant deputy.

Most madhouses, lunatic asylums and retreats are now called "hospitals for the insane," or even "State hospitals," with the word insane left out altogether. This is a species of hypocrisy, as we shall later show, but it has the hope of the hypocrite in it, namely, the recognition of righteousness. They should be hospitals—every bit hospitals.³

³ Thirty-five States use the word hospital, twelve of them (California, Delaware, Georgia, Illinois, Iowa, Kansas, Min-

The ancient implements of inquisitorial torture and some of the modern armament of restraint are absent from these colossal frauds, but implements of assault upon the disease—the laboratories, the squads of laboratory workers; the clinical kitchens and the squads of clinical chefs; the bath rooms and the squads of nurses and masseurs—are nowhere to be found. Behind the doors of a *custodial institution* the crazy boy is shut; the key turns the bolt, and all else is left to fate.

The attendants in the public and private asylums for the insane are not nurses of any sort or kind. They have no education, no training and no *esprit de corps*. One was a farm boy, one a livery driver who wanted to get out from the cold; one was a bell hop who was committed to one asylum drunk and took up nursing at another; and so on, *diminuendo ad finem*. The females are no better, but they need not be characterized.⁴ In most institutions they seem to think themselves turnkeys. They take instructions from the doctors, and in the best managed institutions carry out these directions, which are, for the most part, for sedatives and laxatives. Histories and records are kept for legal purposes, for institutional self-defense.

nesota, New-Hampshire, New York, Ohio and Virginia) without the word insane; thirteen use asylum, thirty use insane; one each use sanitarium, mental and mental diseases in naming their institutions. England still uses lunatic, but her colonies have abandoned that word.

4 "The pay is such that nothing better can be expected; \$20 to \$30 per month is the average. Tips and other graft, such as patients' coats, shirts and shoes hardly attract desirable servants."—v. Barrus: "Nursing the Insane. 8vo. 1908. P. 3.

The handwriting and spelling show the turnkey's neglected schooling. The condition of his wards shows his equipment as a turnkey.

The house staff in one of our best institutions has routine duty laid out to fill at least eight hours a day. The duties are distinctively routine. Thus they resemble the similar duties in a prison. The attitude of the individual makes some difference in the time consumed and in the quality of work. But there is no time or place or equipment; no motive or direction in any of the possible researches into the daily history of the insane, the causes of insanities and the methods of treatment or possibilities of prevention. Few good men stay in the service long. It suits only a misanthrope or pessimist.⁵

The superintendents are another class of highly specialized individuals. They are generally pretty big men, smooth, cautious, conservative, drifting with the tide, reforming sidewalks about their institutions with great boasting and flourish, while they let the patients starve to death or die of infectious or rotten food. They save at the spiggot while they spill at the bung. But their way is beset by many dangers and difficulties. The horde of politicians, from the senators and the speaker of the house down to the local ward heeler, hang to him like bloodsuckers to get graft, favor or preferment.⁶ He must be something of a genius to

⁵ New York, Report State Commission in Lunacy. 1904, p. 38.

⁶ See the Report of Legislative Committee, Investigation of Illinois State Institutions; Forty-fifth General Assembly. 1908. Large 8vo, pp. 1002.

keep the pack off and yet keep them in good spirits. He must play their game and yet keep clean enough to withstand the periodic scandalous investigations which the perfectly legitimate incidents of an asylum for the insane, now and then, when the political waters are troubled, excite a legislature to fix upon as atrocities.

The State is very parsimonious, not to say stingy, in the care of the segregated insane. The most civilized and richest States keep the insane on about fifty cents a day. Some of the States have model institutions that shove it down to twenty-nine and a half cents. In the whole United States the tendency is toward the half-dollar rate. Now what kind of therapeutics can you expect for fifty cents? Laboratories, kitchens, baths, occupational gymnasiums, can't be provided at such rates.

The friends of the insane have no choice, either with State or private institutions. They may pay more or less, but they can get no therapeusis. All alienists look upon insanity as our medical ancestors looked upon tuberculosis—as an hereditary fault, a curse of God. Not only is the sufferer cursed, but his family, even to the third and fourth generation, forward and backward. The parent of an insane boy is not able, be he rich or poor, wise or ignorant, to do what he can in almost any other sickness—get thorough investigation and daring therapy. There are some so-called alienists who look upon insanity as twisted thinking. The followers of Freud try to untangle the twisted ideas and thus cure the patient. They don't try this on the aged, on the so-called general paretic, on the in-

sanities after child-birth, or on the alcoholic; but in selected cases they achieve wonderful cures! So do the Christian Scientists. In fact, this whole idea of insanity is a scientific vocabulary and method applied on Christian Science principles.

The only reasonable hope the friends of the insane boy have is that he may get well, willy nilly. Some do—the psychiatrists say two to ten out of each hundred—and afterward “make very useful citizens.” No treatment must be expected. The resources of the State and the psychiatrists are exhausted in custody, in institutionalism and in red tape.

But why shouldn't the friends of the insane organize an offensive and defensive society—a society to secure and give information and consolation to the friends of the insane during the first shock of the calamity, during the years of struggle against cruel fate, and in the desolation of lost hope; a society to protect the officers of the hospitals of the insane from political persecutions and newspaper defamations; a society to constantly inspect, supervise and formally criticize the conduct of every department of these public undertakings; a society to demand, encourage and further the study of insanity as a symptom of many sick people, its early detection and its ultimate cure; a society to disseminate information as to the true import of insanity in its various forms; a society to do useful things for the insane and the equally unfortunate friends of the insane?

SHALL WE CONVICT, SENTENCE AND PUNISH,
OR COMMIT, CARE FOR AND CURE
THE INSANE DELINQUENT?

WHEREVER society or civilization touches health and disease the medical man may make no apology to enter. Indeed, if he does not enter, he fails in his bounden duty and his profession will suffer in honor and other emoluments.

When we read the morning papers we are struck with the unvarying succession of delinquencies all the way from crimes against person to crimes against property that are committed under such conditions as mark the perpetrator indubitably mad. Many of these delinquencies are the first symptoms of adolescent insanity, others are the oft-repeated obsessions of the old stager. The former are recognized by the alienist as the beginning of a degenerative disease; the latter are known to the local police as the work of well-known crooks. The great flood of delinquencies which furnishes the ostensible occupation of the police is the product of the mind diseased.

We are reminded of the fact that not so long ago all insane people were punished. Now some are confined, some cared for, some studied and some cured. Unfortunately for us physicians, and, possibly, unfortunately for the insane themselves, they are segregated and removed from all possibility of our observation. We, two or three of us, report our opinions to a judge,

he commits our patient to a madhouse, a lunatic asylum, an asylum for the insane, a hospital for the insane or a State hospital (the nomenclature depending upon the stage of legislative fastidiousness), and that is the last time we see him. He falls under the care of a class of medical men who are so far removed from the general and common profession that they are as strange and spooky to us as judges and lawyers themselves. In our medical schools as students and in our hospital service, the insane are no longer under our observation and care. The physicians who are in institutions are too busy in routine work to attend our medical societies, and in some benighted States, legislative enactment makes it impossible for medical societies and clinics to be held in the asylums. By the very necessities of the case, the insane are in the care of a very small portion of the profession—salaried men, who do not think as we do, try as hard as they may.

The most opinionated of us is forced to admit that the great bulk of adolescent delinquents are more in need of a doctor than of a judge. A large portion of the army of hobos that besiege every large town and city are "on the road" because they are sick. They are smoking opium or taking cocaine because the equilibrium of their nervous systems is disturbed. Disease makes the tramp and mental disease the delinquent. "Over half of the murderers," said Dr. Allison, of the Matteawan Hospital for the Criminal Insane, "were received from prisons to which they had been committed for life. At least 40 per cent. of these were obviously insane at the time of their conviction. In

many instances no plea of insanity was put up by their attorneys; in others, this plea was overruled."

In the Province of Quebec, 699 insane persons were condemned to prison during seventeen years (1881-1897), an average of 40 a year. In one year alone, 1892, Paris sent 255 persons to prison who were afterward declared insane and removed from prisons to hospitals. In the Massachusetts Asylum for Insane Criminals, out of 400 men, 216 were irresponsibly insane at the time they were tried, convicted and condemned to penal institutions. Only 40 of them were recognized as insane.

Just how large a per cent. of the crimes against person are committed by the insane it is not possible to say. The opinion of competent observers is at one that it is very large; and from time to time, at least from decade to decade, the estimate of those observers gradually rises. Crimes against property are of a considerably different nature. They vary much according to the location of the bread line and the magnitude of other economic and social factors. But even here a growing portion of the delinquents are found to be insane.

This is not the place to criticise the administration of justice in our criminal courts; it is, however, the place to demand that the insane man whose disease is first discovered by a delinquency—a crime against person or a crime against property—be promptly, safely and decently put in the proper surroundings for diagnosis or cure. We understand that an insane man may be as responsible for a criminal act as a sane man,

but even when that is the case his punishment should **not** take precedence over his cure. His apprehension, his examination, his trial and his conviction should be guided and even stayed by the indications for the treatment of his disease. The public mind may be momentarily outraged by a terrible crime, but public remorse at the deliberate revenge of courts, that should be courts of justice if not of mercy, is not soon forgotten. Note, for example, the vengeance meted out to the insane murderers of Lincoln, Garfield and McKinley and the apologies with which those dark pages of our national history are now written, read and taught to our children.

The public, when informed, will not permit the punishment of the insane delinquent, be he, in the opinion of the court, responsible or irresponsible for his crime. If the convict has pneumonia he is placed at once under the care of a physician and nurse. Insanity is a disease more serious than any of the acute infections. If the convict is insane he should be in the hospital for the insane.

It is only a step further to say that the suspect who is not yet tried and convicted should have as much justice, mercy and decency shown him as the convict receives. We do not wait until after the trial to remove the typhoid to the hospital; we stop the trial until the patient is recovered of typhoid. There may be no statute and no law to such effect, but it is a matter of judicial decency in every civilized community. Does it need a law to put the insane suspect in the same position and stay his trial until he recovers

of his insanity? In Vermont it did, and a hospital was provided in which every delinquent was placed for the determination of his mental condition. The law-made machine did not work true every time, but it did prevent several most disgraceful and expensive trials, and robbed no one except only the clique of professional alienists who hang around the honey pot of the criminal court.

There is one place in which the insane delinquent is wholly unprotected, and that is in the hands of the police. One may always be afraid of being called an anarchist when he criticises the police. We hold, however, that the police have no license to be more brutal or less gentlemanly and dignified toward the arrested one than the judge on the bench or the private citizen in his office or shop. The torture is illegal. If all the suspects were sane, we should have no reason to place our protest as medical men in these columns. We have objected more or less successfully to the ancient custom of the police locking up until the next morning the man with the fracture of the vault just to sober him off. Now again we protest against torturing the arrested man to get a confession of the crime for which he was arrested. The water treatment, the third degree, the sweat box and the inquisitional methods regularly employed by the metropolitan police and their rural imitators may be endured by the sane; but they are cruel, beyond the cruelty of burning witches, to the insane. To quote from to-day's paper (*Chicago Tribune*, June 22, 1909) just a few lines, which can be duplicated

almost any day, is proof enough that the way to justice is cruel:

"The little Chinaman, his eyes bloodshot from exhaustion and lost sleep, was planted in a big chair, while a big captain of detectives and an assistant district attorney stood in front of him driving their questions home.

"You could hear the roar of the captain's voice as he bellowed some emphatic charge, the quieter monotone of the district attorney as he prodded the Chinaman persistently, determinedly, and the falsetto squeak of Chung Sing when they stung him, as they did every now and then, to hysterical rage. . . Chung Sing had been against the police grindstone all day, but you couldn't have told it to look at him except maybe for his red eyes and the nervousness that showed despite his wooden pose. Police official after police official had been pecking at him all day since 6 o'clock in the morning, when he was brought down from Amsterdam, where he had been caught on Monday.

"It was not permitted to Chung Sing to sleep on Monday night. As soon as the lieutenant got the Chinese away from the chief at Amsterdam he began to shoot questions at him. He grilled him while they waited for the train, while they made the long ride to this city, while they were on their way to police headquarters, and where he left off the captain took it up. For twenty-four hours they racked him with questions, getting a little here and a little there."

There is a radical defect in our criminal practice when it fails to take cognizance of the fact that more than one-fourth, if not more than one-half, of all delinquencies against persons are perpetrated by insane culprits. In a large per cent. of all cases the evidence

of insanity can be discovered only by such observation as the law of Vermont provides.¹ The courts are expensive. If they fail to meet their end on account of faulty methods their methods should be changed. If their methods are working to the injury of the sick it is the duty of our profession to make these injuries manifest to the public to the end that they demand correction. In matters of this kind public sentiment, like the judgment of posterity, is infallible and inexorable. It remains for us who know to do away with the disgraceful spectacle of expert testimony for and against the defendant, to abolish police prisons in the hands and control of the police, to make the tortures of the police and prosecuting attorneys as execrable to the leaders of our enlightened press as are the atrocities of the Turk and the tortures of the Spanish Inquisition.²

1 Public Statutes of Vermont, 1906, Sec. 6084, p. 1170.

2 Torture by Indian Police. *The Nation*, London, vol. viii, p. 1038.

THE INHUMAN METHOD OF COMMITMENT OF THE INSANE.

IN THE State of Illinois the insane are committed by a jury trial or by commission. In the city of Chicago the court is held once a week at the detention hospital, in a room about 20x30 feet on the floor, divided by railings into three portions. Doors open into the hospital (?) which is under the charge of a physician, who brings the patient and his history into court and gives his opinion and diagnosis. The jury or each jury, as there are usually two, consists of one physician and five other men. A jury hears four cases and then retires and the other jury comes on and hears the next four cases. The duty of the jury seems to be to obey the dictates of the judge, and he may overrule their findings or that of a commission. The judge is a circuit judge, so-called; the one on duty at the time referred to in this article, was from the country, *i.e.*, outside of Cook County. He did not seem to be especially expert as an alienist.

There were more than forty cases called for nine o'clock on the Thursday morning here described. They were all disposed of by the two aforementioned juries. An army of witnesses were called, all of them at 9 o'clock, and they seemed to be on hand, filling waiting-rooms, stairways, halls and every approach to the diminutive courtroom. All the cases were disposed of before noon, except one which was contested.

The witnesses were brought in sometimes with and

sometimes without the patient, or accused, which shall we say? They were let inside the rail together and sworn. Then the examination began with the report of the physician of the detention hospital, and was conducted in a haphazard manner by attorneys, jurors, and the judge. Everybody was declared insane except one woman that every witness testified was, in his opinion, crazy and that every juror apparently believed was irresponsible. Not all were committed, however. Something more than one-fourth of these unfortunates were taken home by friends. They were not the chronics, but the acute cases that ought to be amenable to hospital treatment now if ever. The anxiety and devotion of the friends of the insane was a most heart-warming, if heart-breaking, spectacle. Their affection, however, did not always guide them aright. The fear of institutions, which is not entirely unfounded, led them wrong. The judge assessed the friends ten to twenty-five dollars for each committed patient for the expenses of commitment and transportation to one of three asylums within a radius of fifty miles. The whole proceeding was more terrible than the infamous Monday grind at the Harrison Street police court. Officers whose duties require their attendance on this court are apt to get drunk on Thursday afternoon!

It is our contention that such a method of commitment is irrational, ineffectual and unmerciful. It is dangerous, extravagant, demoralizing and cruel. It is law run mad with the sick, it is ignorance and red tape in an emergency. It is an irreparable injury to many of the insane, an unnecessary and unusual punishment

to the friends of the insane, and a stinking, rotten sore on our civilization.

Even the execution of the present law is unnecessarily cruel. All the cases are called for nine in the morning. Call it ten. The witnesses, often neighbors or physicians, are obliged to remain willy-nilly until twelve or one o'clock with no place to wait in. This is unnecessary cruelty to them. The presence of the patient is indispensable.

It was pitiable to see the helplessness of the friends of the insane. They were overcome by the terrible and inconceivable misfortune which had befallen them. They had no precedent on which to depend. They had never been in court before and had looked upon judges as those who condemn and sentence to punishment. The surroundings were all cold and unsympathetic, not even what you might etymologically expect, courteous and civil.

The courts assume to guard personal liberty by the force and graft of a jury trial. The constitutional rights of personal liberty makes the law which allows of commitment by commission inoperative in Cook County, where the judges are so jealous of personal liberty. More than ten thousand commitments have been made in Cook County without a single appeal from the orders of the court, until the other day a perfectly safe and self-supporting but committed paranoiac, acting as his own attorney, convinced the court after reading a lucid plea that he was entitled to an appeal, showed the form and destination of his bond to an astounded judge and got his legal privilege allowed.

Illinois still remains in the background in all matters relating to the treatment of her wards. Her epileptics are at large, her police are hounding the delinquents who have not yet shown the unmistakable evidences of insanity; and while millions are spent in penal institutions and in custody, not a dollar is appropriated for the prevention of either insanity or crime. The sick who need hospital treatment or segregation must be brought to an uncourteous and merciless tribunal, which sits only on Thursday morning, to be allowed a chance to the none too liberal therapeutics of the State hospitals for the insane. The jury is an asinine form, the presence of the sick person in court is unmerciful and cruel, the long hours of attendance of witnesses is barbarous and despotic, and the selection of such merciless legal forms for the more humane commission provided by statute is a judicial tyranny which ill becomes a democratic State. Until the organization of the friends of the insane can make their influence felt such atrocities are likely to be committed in the name of liberty.

FINDING A WAY OUT FOR THE LOST MIND.

IN A recent lecture before a meeting of educated club women a newspaper reporteress spent the hour in a literary conversation on Charles Lamb. The significance of the lecture to us lies in the attitude of the speaker and presumably of a majority of the audience toward the mental condition of the unfortunate Mary Lamb. More than half the hour was devoted to the mysticism with which her conduct was dressed. The sacrifice which Charles Lamb made was criticised in the light of crass utilitarianism.

There still remain in the minds of the educated about the same attitude toward the insane that our ecclesiastical New England ancestors manifested toward the witches. The sister of Charles Lamb might have had any other disease without arousing among literary critics more than a sympathetic mention. Had she been blind and mute no one would have questioned the propriety of an equal devotion or criticised adversely the sacrifice which her brother made for her comfort and happiness. The sentimentalists of to-day have no trouble in getting special legislative appropriations for the Helen Kellers of each State. In romantic literature and in ordinary gossip the etiology and manifestations of insanity are portrayed and exposed in a dim and sulphurous light and surrounded with grizzly mystery. Even the guardians of the insane have been known to shudder and cry "Birr! Birr!" at the sight of a hundred or

more unfortunate demented huddled in a gymnasium-like dormitory.

The modern literary mind still holds to the traditional. Our current novelists, having exhausted their ingenuity with normal human passion, introduce among their relatively and conventionally sane characters the problematically or obviously insane. In two of our most dignified monthlies appeared during a single month novelettes in which one of the characters was insane. A year or so ago one of the magazines ran a long serial the hero of which was crazy and his sister feeble-minded. The cloak of mysticism and the inexorable clouds of heredity were thrown around the pathological psychology of the characters which the imagination of the authors built up. The theory of a diabolical origin of insanity, which arose from ecclesiastical prejudice, has given way as an adequate cause for mental aberration; and heredity, the scientific bogey-man, rules the stage.

Of course, the thoughtful physician knows, and has known for half a century, that insanity is a symptom of many diseases, just as anemia is. He has seen one form of anemia after another pass from the mysterious into the commonplace. The still unknown anemias which masquerade as "pernicious anemia," "leukemia" and "pseudo-leukemia" are no longer looked upon as dispensations from heaven or hell, but as inevitable results of adequate though unknown causes. Our knowledge of the hookworm disease, kala-azar and the trypanosome have taken away three territories from this unknown country of anemia and also opened up

new methods of study which have been neglected since the discovery of the hookworm seventy years ago. The same conquests may be hoped for in the region of the insanities. The physician does not take kindly to the idea that insanity is a perversion of reason, a sort of Christian Science idea transferred to a narrow field of medicine. He knows that the aged are insane and demented because the machinery of nutrition, excretion and physiologic resistance is used up. He believes that general paresis comes upon the syphilitic because syphilis has reduced the resistance of his body to some ever-present organism that thus succeeds in invading his protective mucosa and his cerebro-spinal lymph ways. He believes that the alcoholic and the dope-fiend becomes looney because the drug has both poisoned them and diminished their normal resistance to invasion by micro-organisms that further intoxicate them. He knows that the insanities of hyperthyroidism and myxedema are two forms of so-called auto-genous toxemia, and so on to the end. There is no form of insanity which the physician is willing to consider a dispensation from heaven or a witchery from below, and, therefore, in either case, hopeless of cure and prevention and beyond scientific investigation and explanation.

Let us review the progress of a few indubitable extensions of the boundary of our knowledge of anemia for a first lesson.

The hookworm was discovered in 1838, but more than sixty years afterwards Ashford demonstrated that it was the cause of the larger part of the morbidity and

mortality in Porto Rico. Only during the last ten years and largely through the work of the Agricultural Department, has the extent and importance of this parasite in the United States been recognized by the profession and the public at large. Clyde Smith, of Atlanta, demonstrated the origin of ground itch and the possibility that the hookworm gains access to the body through the skin. This placed the discredited observation of Loos in its proper place, and made it evident that the ground itch was in a considerable number of cases the beginning of the hookworm disease.

Another instance which has not been so well recognized because the disease is not known to exist in America is the so-called black water fever, or kala-azar, of Assam. Since 1882 this disease has decimated the population of an area larger than Texas. When it has passed over a country it subsides, leaving frequently less than one-ninth of the population alive. The disease was long known as malarial cachexia, and only during the last ten years has the essential etiologic factor been proven to be a flagellated piroplasma, an obligate parasite of some such animal as the bedbug. This micro-organism is known as Donovan's body. The disease which it produces resembles typhoid and malaria in so many particulars that a clinical diagnosis can be made only by long observation or by the most exacting microscopical and biological tests. The leucopenia, the absence of the malarial organism and the Widal reaction, however, makes an early relative diagnosis possible. Isolation, segregation and the exter-

mination of bedbugs secures safety to the unaffected and arrests the epidemic. Dodds Price was able to keep coolies in perfect health in new shacks, though only two hundred feet away from quarters in which cases of kala-azar were appearing and dying every day. He saved the English tea gardens of Assam by first killing the bedbugs in the old shacks, segregating the coolies that were already sick and securing absolute freedom of shacks and coolies from vermin. Kala-azar has also been recognized in Burmah, and there is reason to fear that it will sooner or later be found in the Philippines, in Australia, and, possibly, the southern United States.

Mountain fever or tick fever is almost perfectly illuminated by the work of Ricketts. It remains only to apply our knowledge to prevent this disease.

The conquest of yellow fever is so recent and the tragic and irrefutable demonstration of its cause and prevention are so popularly known that it needs only to be mentioned. The dark speculations that once surrounded the etiology of this disease are in the forgotten literature of medicine.

The hookworm disease affected a million or more, the sleeping sickness has depopulated Africa, the Donovan body of kala-azar has nearly ruined the province of Assam, the yellow fever germ and mosquito has killed its millions and set back the civilization of half a continent three hundred years.

But what does all this mean? We have established a Sleeping Sickness Commission, a Wellcome Laboratory, a School of Tropical Diseases, and fearlessly in-

vaded the tropics to take the moat out of our neighbor's eye, while 150,000 insane are segregated in the custody of our madhouses and no adequate effort is made to study the causes of insanity. The Phipps endowment at Johns Hopkins, the Laboratory of the London County Council and the fitfully supported Psychopathic Institutes of New York, Michigan and Massachusetts are overcome by the magnitude of the problem before them.

Insanity is one symptom of many diseases. In the very old, insanity is a terminal symptom, and the senile make up nearly 10 per cent. of all admissions. The adolescent insanities are the most pitiable and most hopeless. They furnish about 40 per cent. of all admissions, and only 3 or 4 per cent. recover. The manic-depressive group claim about half the admissions, and furnish the largest per cent. of recoveries. About 20 per cent. of these recover.

The attitude of the leaders of the institutions for the custody of the insane toward the study of the etiology of insanity is illustrated by the proceedings of the national societies and publications of psychiatry. The proceedings of the American Medico-Psychological Association (497 members) for the 1909 meeting contains 590 pages and thirty different contributors. Only three of these contributors (namely, Stanley, "A Report of Three Cases of Korsakow's Psychosis;" May, "A Review of Recent Studies of General Paresis;" Moore, "Application of Immunity Reaction to the Cerebro-Spinal Fluid") discuss scientific physical problems.

In regard to the attitude of the society toward the investigation of the physical condition of the insane, the lack of discussion is most significant. It would appear that stenographic notes of the discussions were not always made, or if made were not used, so that many omissions are evident. Still it is evident that there is the greatest pessimism regarding the causative relation of any physical condition, even exophthalmic goiter, to insanity. A few, however, cast discredit upon heredity, and made it a waning factor in the production of mental aberration. The most authoritative alienists are against the whole idea of a physical basis for the etiology of insanities. Note, for instance, the unchallenged conclusion of Campbell on pp. 412-413, *loc. cit.*

Turn the pages of any or all of the journals of psychiatry and insanity, and the conclusion will be forced upon you that the alienists are not doctors. They are keepers of the insane. Many of them are good lawyers, many are good administrators, all of them are good politicians and men of superior intellects, but they seem to be outside of pure science and of practical medicine. Nothing, in my opinion, can be expected from the present rank and file of the keepers of the insane in investigating its etiology.

One of the first things to do in approaching the problem before us is to separate the conditions precedent to the insanity from the conditions incident to the custody. The intensive study of tuberculosis has put this complication in its proper place—it is the result of the institutionalizing, poor feeding, overcrowding, over-

heating, indoor confinement. The happy appearance of pellagra in nearly every institution for the insane ought to change the dietary from the unknown and neglected to the show-room of the madhouse. Tuberculosis and pellagra are bred by starvation or inadequate and improper diet. Pellagra is at once the cause of one insanity and the result of the cut and dried institutional life of the insane asylums.

In the surgical hospitals of our ancestors (before 1870) certain wound diseases were endemic. Every fresh lacerated wound was planted with pus microbes, with erysipelas cocci or with the bacillus of malignant edema before the patient had been in the hospital a week. The attitude of the surgeons of the time (Larrey, "Observations on Wound Diseases," Philadelphia, 1832) is remarkably parallel with the attitude of the custodians of the insane to-day. It was the pure scientist, Pasteur, and a deluded surgeon, Lister, that at last eliminated the dangers of hospitalism from wound treatment, and made remedial and elective surgery take the place of terminal surgery.

The interested public must put away the idea that the insanities are without adequate tangible physical cause, and the subject must no longer be taboo in scientific, medical and social conversation. It is far less disgraceful to the individual, to the family and to the community to have a case of insanity appear in it than to have a case of typhoid. The origin of the former is unknown and hence unpreventable; the source of the latter is positively demonstrated and its presence inexcusable.

The insanities, so far as their etiology is known at all, are toxemias, and the sort of toxins and the possibility of their prevention and elimination await advances in chemical dietary and perhaps physical science, or the application of neglected facts long available.

The present custodians of the insane have no sympathy with and no incentive for the study of the causes, cure or prevention of the insanities, and the insane asylum to-day is a chilly place for scientific study of any sort or kind. Even in some of the "psychopathic wards" the routine investigations remind one rather of the sacerdotal confessional of some strange cult, or of the séances of the votaries of a complicated system of planchettes than of a scientific investigation.

The *vis a tergo* of any adequate study of the condition of the helpless insane must come from their friends still unconfined. Their influence should be used in every possible direction; first, upon the schools of pure science by the establishment of scholarships and prizes; second, upon legislators to devote a tithe of all appropriations for custody to a study of etiology, prevention and cure; and lastly, to point out to the generous millionaire a most hopeful field of scientific adventure.

THE PHYSICAL BASIS OF DEMENTIA PRECOX.¹

As LONG as the pathogenesis of a disease is unsought and unknown, no rational treatment or prevention can be looked for. The fact that the senile, syphilitic and alcoholic insane are in a relatively hopeless condition, on account of the essential elements of these conditions, makes their care largely custodial. If any group of the insane need study and promise possibilities of cure, it is the dementia precox group. The professional keepers of the insane, however, make no studies of the physical conditions of these unfortunate youths. They are weighed and measured when they enter the asylums as the rules usually prescribe. Sometimes other clinical examinations are made, and even the Bertillon identification system is applied in all its perfection. The further study of the cases is unprovided for. There are no laboratories where any borderland examinations can be made, were there any students in interne service capable of physiological and chemical analyses. One State superintendent, whom the writer consulted, spoke of his disheartening efforts in studying the toxicity of the blood in certain cases. He was short on equipment, on animals, on cages, on men, and inexorably obstructed by custom, financial limitations

¹ This clinical term is applied by many modern psychiatrists to a mixed group, mostly adolescents, who show a tendency to a peculiar course toward dementia.

and political interference. Even the civil service rules prevented his securing a capable investigator.

The complacency and stoical inactivity of the great mass of the professional custodians of the insane are impregnable. They have all the patients. They are under no obligation to cure anybody. The institution is everything; the patients are simply inmates to be kept until they go or are taken. Any attempt at cure is outside the *esprit de corps* of these intellectual pessimists and emotional nihilists. Such a proposition as a cure is received with the same air as one of the illusionary vagaries of a deluded patient. One soon falls down before such resistance when he has to meet all the other discouragements of a pioneer. But these studies must be made in custodial State institutions. They must be made by men whose motives spring from the heart. Our only hope is in votaries to humanity rather than in savants of science. The problem requires team work between clinicians, pathologists, chemists and physiologic chemists. It must be done with all the resources of a university—laboratories, libraries and the broadest knowledge of pure science.

It should be one of the first labors of "The Friends of the Insane" to establish fellowships in all accessible universities for the study of the physical basis of the insanities. The millions now squandered on ostentatious custody in private madhouses could be well saved by placing the fifty and the hundred and fifty dollar a week patients in the State institutions and using this money in promising investigations of the origin if not the cure of the disease. The universities have the men

in training, the laboratories, the libraries and the mental and cultural surroundings necessary for this long hunt into the darkest and most weird continent of human ignorance. Ten such fellowships in one of our larger universities could be *maintained* for twenty thousand dollars a year. This money could be saved by transferring twenty patients from the utterly useless, if not dangerous, luxuries of our private sanatoriums to the equally sanitary wards of the State asylums. It is not beyond the hope of the human heart, it does not overreach our confidence in the ingenuity and subtlety of the human mind, it does not certainly surpass the precedents of the past, that by such a united attack on ignorance a way could be found for cure and prevention of the insanities of the young.

While most of the psychiatrists are following Freud and Jung in their mental unravelings, a few keep in the path of true, sane, scientific and material investigation. They see in the first prodrome of dementia precox the methyl-like toxemia which at last verges into mania, katatonia and dementia. They see the poisonous hydrocarbon in the acetone breath of each exacerbation. They mark the antitoxic action of an accidental erysipelas or typhoid when a dementia precox case shows a comet-like sanity during the disease and often for weeks afterward. The osteomalacia which many of these patients show seems only to confirm the toxic etiology of the disease of which insanity is the overshadowing symptom.

When the toxins which produce the many diseases of which dementia precox is a symptom are chemically

recognizable, then it will be time to find a means of their elimination, destruction or prevention. Until that time, let us be overactive and oversanguine rather than coldly agnostic.

ARE ANY INSANITIES CURABLE OR PREVENTABLE?

THE insanities of the aged are a part of senility. The insanities of the syphilitic are a part of the destructive processes incident to the infection. These two terminal symptoms, the one of old age, the other of spirocheta pallida infection, are alike in their generic etiology. The insanities of the young are placed in a separate category. There is every reason to believe that dementia precox is a toxic process. It is initiated by symptoms quite various in different individuals, all, however, plainly of toxemia. It is characterized by exacerbations and remissions, seasonable or cyclical. The conditions of the excretions, of the kidneys, of the skin and of the lungs, are positively indicative of erroneous metabolism. There is usually a long prodrome of intestinal, or, better, of digestive disorders. During the acute stages acetone appears in the breath and urine, and marked changes go on in the blood.

Every physical sign of disease is overshadowed in the minds of the alienists by the psychical manifestations. The medieval assumption is accepted as a scientific fact—that the person is possessed of a devil or obsessed of an illusion. All the changes which disease has wrought, or may in the future produce, in the patient's body, are simply the workings-out of a deluded mind upon a body hereditarily defective. The possibility of the reverse never occurs to the true and loyal psychiatrist more than it does to the faithful Christian

Scientist. The remarkable cures which they are each of them able to produce upon the hysterical, confirm them in their faith and preclude any chemical or nutritional study.

There are more than 150,000 insane in the asylums of the United States. Of these, half belong to the senile and syphilitic, whose stay in the custody of the State, from the very nature of the conditions, must be rather short. At least 30 per cent. are of the adolescent group. They remain in custody, in spite of tuberculosis, typhoid, pellagra and erysipelas, a very long time.

The expense of custody of an insane person varies between \$150 and \$200 a year. In the public institutions a small proportion of patients have estates from which the State is reimbursed. In the private institutions \$25 to \$250 per week is charged for more ostentatiously luxurious but not more curative custody. The private corporations that care for the insane are not subject to any effective official supervision, and they support no research or educational work. A few States have so-called psychopathic hospitals. So far as published work indicates, they have no adequate clinical laboratories and laboratory kitchens. The only two of which the writer has an intimate knowledge have no adequate bathing facilities. These institutions are not making any vigorous onslaught upon our ignorance of any of the insanities.

The grand total of State expense for the care and custody of the insane cannot be far short of \$50,000,000 a year. The expense to the country as a

nation, through loss of at least 25,000 citizens a year, is equal to a state of constant war. If every State expended in research 10 per cent. of the perpetual dump into custody, a small squad of scientists would be at work on measures designed to end this inglorious largess.

It appears to us that through the researches in physiological chemistry, the first surveys of this dark continent of pathology is being staked off. The long-known toxicity of the alcohol radicals, of which methyl alcohol is the most alarming example, has been given new significance in relation to sleep and fatigue. The action of mineral poisons and physiologic processes sets free the carbohydrate radicals, which are the real toxic and narcotic elements, as well as the long-known signs of various constitutional diseases. In pure science aid must come.

The exclusion of all the insane from the regular profession and from their hospitals, puts all the responsibility as well as it gives all the opportunity to the officers of the State. If they expect to hold the positions they occupy, they must clean house and make their asylums into hospitals. They must stop the building of castellated fortresses and construct temporary workshops, laboratories and bath-houses on the ground. Instead of sitting with a fateful complacency in their own luxurious quarters, they must organize a squad of scientific sappers and miners and fearlessly and hopefully assault our ignorance.

THE CONDITION OF THE BLOOD IN THE INSANE.

THE insane suffer from all the diseases which afflict the rational, among them the so-called diseases of the blood. The diseases of the blood are for the most part symptomatic, and it would be unreasonable to consider them, apart from other symptoms, as indicative of a more general and primary disease. In any case the study of the conditions of the blood in the insane is admitted as desirable, though it is conceded that it is much neglected.

As early as 1854 W. L. Lindsay published a monograph, "The Histology of the Blood Changes in the Insane," and since that time many articles have been published on special aspects of the subject, each author led by his own prejudices or those of his time. Notice especially (not for their value, but to show the bias and superficiality of these studies) articles by the following authors: Seppelli, 1886; Smyth, 1890; Weber, Agostini, d'Abundo, and also Krypiakiewicz, 1892; Roncoroni and also Verster, 1894; Burton, 1895; Summers and also Harrison, 1896; Ceni, 1897; Heverech-Kobliha, 1898; Lambranzi, 1899; Mackie and also Wherry, 1901.

Any real knowledge of the histology, physiology and pathology of the blood cannot be said to have existed previous to 1890, and the most important reactions of the blood have been perfected since 1900. Even now there are many conditions which are clinically

recognized that have not been followed up chemically and morphologically. Of this general fact every reader will recognize that puerperal toxemia is a lamentable example. Osteomalacia, fragilis ostium, myositis ossificans, arthritis deformans, pernicious anemia and melena neonatorum are equally striking but less familiar instances of the same state of affairs.

The disease in each case is named for the overshadowing symptom, but in every instance the foundation is a toxemia. The toxemia in eclampsia is apparent to every physician and obstetrician, and practically the same toxin is found in the visual disturbances, in the uncontrollable vomiting, if not in the so-called physiological nausea of pregnant women. No one believes that the blood is primarily at fault. Clinically, most patients recover after an artificial delivery, and symptomatically the gravest symptoms are relieved by bleeding and replacing the lost blood with a normal salt solution. In spite of the frequency of this disease, the labors of the obstetrician have been fruitless in finding an adequate and demonstrable source of the toxin (*v. Culbertson, Surgery, Obstetrics and Gynecology*, April, 1910). It is not to be wondered at, then, that the rarer toxemias of the conditions mentioned above should still remain utterly unknown.

There are two distinct reasons for studying the blood of the insane as soon as the patient comes under observation; the first is to discover the presence of a well-known underlying disease, such as septic endocarditis, of which the acute mania is an overshadowing symptom, and thus put the patient in the best possible

condition to be treated; the second is to make such researches as will elucidate the problems of insanity.

Every institution for the insane receives maniacal patients that are suffering from all sorts of physical ills, from fractured skulls and perineal lithotomies to gonorrheal pyonephroses and streptococcus septicemias. The examination of the blood in some of these patients would result in their immediate recognition as acute hospital cases, and a part of them at least would be diagnosed before they came to autopsy, and possibly before it was too late for medical or surgical therapeutics. This contention I am sure is denied by no one.

There are, nevertheless, many who would think a repeated, complete, careful, purposeful study of the blood of the insane in our public institutions unnecessary and time-consuming routine. It would perhaps at once separate the blood findings due to institutional life from those due to the primary diseases. It would perhaps give a hint of epidemics, such as the epidemic of pellagra at Peoria, before it had involved so large a number. But it is in order to explain and possibly utilize some of the incomprehensible reactions of the insane to the infectious diseases that this study should be carried out. More than thirty years ago Savage noticed that a considerable number of patients recovered from their insanity during typhoid, erysipelas and extensive suppurative disease, and since that time a great many observations of the same sort have been made. Probably the most uniform and general improvement has occurred in typhoid, but the most permanent and com-

plete, in both acute and chronic cases, in maniacal and demented cases, has followed streptococcus or erysipelatous disease. In two epidemics at Independence, Ia., Boody noticed that 25 per cent. of those attacked by typhoid made great physical improvement on recovery, and 16 per cent. of the dements improved mentally in a remarkable manner, but relapsed; one case of catatonia and one case of acute mania recovered completely and permanently. Even patients that have been insane for many years have recovered and been discharged from the asylum after recovering from the typhoid. Twenty-one cases that were observed by Campbell made great improvement during and after the typhoid, and six left the asylum clear-minded.

Bullin and Goodall suggested the production of an artificial streptococcus infection, but I find no reports of their experiments. Some work in the same direction has been done by the Italians. Coley's toxin, which has been so successful in the treatment of sarcoma, has also been empirically used in a few cases of insanity.

The Scotch alienists are making very extensive study of the blood of the insane, and have tried to secure effective hemolytic reactions, but so far their work is valuable only in fixing the toxic origin of insanity on a firmer basis. Much and Holzman, of the Eppendorf Hospital (1909), have raised a tempest in a teapot by publishing the results of their cobra-poison reaction. They found that all cases of dementia precox, and a part of the manic-depressive group, invariably reacted to this poison, while other insane patients and most rational people did not. A great number of other

German hematologists repeated these experiments, but so far they do not agree in their criticisms.

It is sometimes assumed that the improvement that comes to the insane during typhoid, erysipelas, scarlet fever, smallpox or other disease, is due to the high temperature. Therefore, artificial hyperpyrexia has been tried, but without result.

The appearance of polycythemia and methemoglobinemia in cases of dementia precox, and the demonstration by Gibson (*Quarterly Journal of Medicine*, 1909) of the intestinal origin of the toxemia of which these conditions of the blood are symptomatic, and also the well-known frequency of osteomalacia in dementia precox, excites our curiosity as to the possible discoveries to be made in this quarter. The coagulability of the blood in polycythemia of the insane has been found very high. As the blood has flowed from the median vein it has piled up in the bowl and frequently stopped flowing by the formation of a clot at the opening. The quantity of blood in proportion to the weight of the body has also been found very great. All these facts show the need of constant, frequent and regular blood examinations of the most extensive and exacting kind.

Such examinations, taken together with other well-indicated physical examinations in the institutions which now segregate from the medical profession the quarter of a million of the insane and monopolize this perfectly controllable clinical material, would be very inspiring to the small corps of well-equipped hematologists that our better institutions are sending out

each year. The darkest continent of clinical pathology promises adventures and discoveries which would satisfy the ambition of the most strenuous and indefatigable.

But how can such an active campaign of research be set in motion? The pressure for this study cannot come from the insane themselves. There is no competition among State institutions. The superintendents have a hard time now to keep things running smoothly. The patients' needs and the scientific opportunities are not pressing so hard as the discipline, the patronage and the appropriations. It is left to the *friends of the insane* and the medical profession, from whose observation and care they have been removed, to insist on the regular, frequent, complete and purposeful study of the blood of the wards of the State, to the end that some inroads be made on our ignorance of the conditions of which the insanities are the compelling symptoms.

SEROLOGY AND PSYCHIATRY.

THE defenceless find a defender in the brave, the helpless a helper in the strong. Who is strong enough to help the lost mind to find itself?

We are so rich that we spend millions every year to keep the insane out of our way. We have built antiquated lunatic asylums which we now call hospitals, but are they in fact hospitals or are they hospices? It is the duty of the hospital as it is the duty of the doctor to cure the sick. The European hospital of 1820 was a dreadful place. Von Langenbeck came home from England and introduced relative cleanliness into hospital practice. Lister learned the lesson of antisepsis from Pasteur's study of the silkworm. When the routine and conservatism of the hospitals of the world had been thoroughly conquered by the antiseptic methods and by the ceremonials of cleanliness, gangrene—the now forgotten hospital gangrene—erysipelas and pus disappeared, and the injured patients were quickly cured, sent home and their beds given to the needy. The average stay of each patient in the hospital was reduced from weeks and months to days, and the utility of the hospital multiplied without increasing its capacity or expense.

As it is, our madhouses contain 200,000 citizens out of 80,000,000, and the proportion is growing. In Washington State one out of every 238 citizens is a ward of the State—insane, criminal or defective. Of all the millions spent in custody, not one dollar is spent

in the only rational and legitimate functions of a hospital—in cure.

Of course, we do not know the cause of the insanities. Sometimes we can say when we see a person that he is crazy. Likely enough he is, but when we get down to bottom rock and tell why we say so, there is nothing left for us to say but "'cause he is."

In our lunatic asylums no systematic, adequate, persistent or creditable effort is made to search out the causes of the insanities, nor to vigorously prosecute rational methods of cure. Our madhouses are without laboratories, clinical or research; they have no therapeutic gymnastic apparatus in use; no occupational or re-educational training schools for the convalescent, and no baths commensurate with the needs even of present-day ideals.

Worse than all this there has come over a great class of alienists a withering mould of mysticism from the East. The head of the whole faculty of a sovereign State, a man on whom the education, culture and experience of the world has expended itself, has come forth to say "mental diseases are the results of mental tangles," and that "mere disposition is not disease." When the head of a system puts forth sentiments worthy of a Christian scientist or an emasculated monk, what may the psychologic prestidigitations of the State laboratory bring forth?

In another locality the scion of a most distinguished medical ancestry who adds social prestige to versatile accomplishments, has given his professional *visé* to the religio-medical laying-on-of-hands, known as the Emmanuel movement.

From these great lights it is only step by step down to the throng of physicians, psychiatrists, healers and grafters of one sort and another; here using psycho-analytic methods and there hypnotism or hypnoidism, here a tangle of electrical, optical, acoustic, gustatory and olfactory paraphernalia of delusional complexity, and there reading the etiology, pathology and indications for treatment in the pupil of the eye, studied in a dark room with a tallow dip and a thirty-cent magnifying glass.

Their publications are multiple and some of them magnificent and adorned with names seen in better company (*e. g.*, "Psychotherapy, a Course of Reading").

In spite of this, the compact and invincible army of scientific investigators goes on sapping and mining the entrenchments of ignorance and mystery. There are long periods of apparent inactivity and barren endeavor, but these heart-sickening preparations are necessary to a victorious assault.

At the present time the chemico-physiologic study of the blood is bringing forth its first-fruits. It is not enough that a reliable test for typhoid is in the hands of every doctor, and that an equally serviceable test of syphilis is at his disposal in the hands of the hematologist or professional pathologist. It is not enough that a method of artificial immunity is in his armamentarium against diphtheria, rabies and tetanus. The methods which attend the study of these phenomena place the *materia morbi* in new exposure and subject it to a new method of observation and attack.

The real scientist and student-physician is not slow to take up these weapons of cure. Against the mental diseases, however, not much progress has been made, either in discovering their etiology, solving their pathology or securing a cure.

There is a deadly parallel between eclampsia, malignant jaundice, acute yellow atrophy of the liver, phosphorus poisoning, delayed chloroform poisoning and dementia precox. In all these conditions there are physical findings of intoxication and starvation. In all these are pronounced nervous phenomena. In all these the loss of weight, the acetone breath, the dilated pupil and urinary findings indicate grave errors of metabolism.

There remains little doubt in the mind of the pathologist that eclampsia is due to an intoxication from substances produced in the fetal membranes. Eclampsia is a manifestation of this intoxication, due apparently to an increased susceptibility of the patient toward the end of gestation to the toxin which is present from the beginning of pregnancy.

The evidence is increasing that the morning sickness, looked upon as physiologic by our ancestors, the uncontrollable vomiting of pregnancy, and many other complications of childbearing, are due to the same toxins developed in the surroundings of the fetus. This toxin is so uniformly present in early pregnancy that it has been used by Fieux and Mauriac as diagnostic of that condition.¹ The appearance of eclampsia seems

¹ *Annales de Gynecologie et Obstetrique*, vol. 7, p. 65, February, 1910.

to be due to a sort of anaphylaxis which the patient attains from a variety of accidents or causes.

That etiologically unsolved problem, acute yellow atrophy of the liver, is indisputably toxic. What is the source of the toxin we may only guess. Why it acts in such a fulminating manner is another mystery.

Of all the parallels, that by phosphorus poisoning and acute yellow atrophy are most intricate. They verge, however, into those of eclampsia, and eclampsia is related by many common factors to puerperal insanity. In the earliest reported cases of acute yellow atrophy the mental symptoms are given great prominence (Frerichs, *Clinical Treatise on Diseases of the Liver*, New Sydenham Society, London, 1860, pp. 194-196), and the pathologic findings in all these conditions have a remarkable analogy.

The early toxemia of pregnancy, on which Fieux and Mauriac make their hemolytic diagnosis, is due to a period of maximal chorionic activity, and is based upon a vello-toxemia. It was Veit (1901) who suggested that the toxemia of pregnancy was a syncytial toxemia, and occurred from a lack of syncytolysin on the part of the mother. The French have long held to the autotoxic nature of all the toxemias of pregnancy, from acute yellow atrophy to puerperal mania. There are great changes in metabolism during pregnancy, which resemble similar changes during menstruation as a storm resembles a shower.

Adolescence, like gestation, is attended by a revolution in metabolism, not always happy in its termination. It is the most critical period of life, and is

attended by dangers and catastrophes, of which dementia precox is the most terrible. This condition is by all odds the most mysteriously melancholy and the most pitifully hopeless of medical aid that can befall the human soul. The body is overcome by vague distress, the mind by static indecision; nutrition fails, excretions are perverted, the muscular system is completely overcome by the toxemia, and the hematopoietic apparatus is thrown out of time. It is not a sudden and surging wave of intoxication, but an inexorable rising tide of toxemia, the source of which is unknown and practically unsought.

It is difficult in speaking of adolescent insanity to be at once definite and unmistakeable, and yet use the clinical terms of the alienists. There are no pathologic terms applying to the insanities of the young. General paresis and senile dementia have some pathologic foundation. The search for some toxic foundation of manic-depressive insanity has already been undertaken. Bruce (*Journal of Mental Science*, October, 1910, vol. lvi, p. 630) has made a promising beginning. Much and Holzman (*Münch. Med. Woch.*, May 18, 1901, p. 1001) have applied the cobra venom hemolytic test to the insane with results which have been confirmed by many in every essential degree. Much (*Berliner klin. Woch.*, vol. lxxvii, p. 1492, August, 1910) has further extended the practice of serology to psychiatry and given three distinct serologic tests, which should become a routine in every madhouse that claims to be a hospital, and be continued and extended as science furnishes new methods. One is the Wasser-

mann test, which should not be neglected by any clinician; the second is the cobra vemon reaction of Much and Holzman, and the third is Geissler's precipitin test. None of these tests are of ultimate or positive diagnostic significance, but they penetrate a little way into the unknown. If there is any mad-house that would become in fact, as well as in name, a hospital for the insane, no cytolytic or other chemical, physical and rational investigation can be neglected until our ignorance of the condition has been cleared away. Such trifling numbers as Bruce reports (fifteen), or the arms-length examinations made in New York of patients in Connecticut, cannot possibly meet the requirements of this pioneer study.

In less than ten years the *contagium vivum* of syphilis has been discovered, and an absolutely new remedy has been put forth. More important, if possible, than this discovery, has been the extension of the reaction of Wassermann to the almost infallible diagnosis of syphilis. By this new hemolytic method the presence of the disease can be established with certainty and celerity, and the effect of treatment can be guided and checked.

Out of the millions now spent in custody of the insane, by a method that insures the most perfectly unhindered destructive action of the disease upon the patient, and imprints deeper the inevitable injury of the intoxication of the venom of the insanities, not a mite is devoted to research. The segregation of the insane precludes any meddling by the methods of the ordinary hospital, and outside of isolated, fickle and

trifling attempts, no serious study of what the alienists call somatic conditions exist. The psychopathic wards, institutes and hospitals are devoted to playing horse with hysterics, and are equipped almost as well as the institutites and sanitarium of some pupil-gazing quacks.

When we consider the almost uniformly positive Much-Holzmann reaction in dementia precox (a uniformity almost equal to that of syphilis to the Wassermann), we cannot longer fail to use and require its use for diagnosis, and continue our observations until more light has been thrown upon the subject or better methods proposed.

It may seem that these examinations are fruitless, and that remedies are what we want. Perhaps they are; but we want more than all to dispel mystery and ignorance. Each newly discovered fact opens up new vistas of ignorance and new possibilities of conquest. Let us see to it that we take the next step at once.

MYOSITIS OSSIFICANS—A LESSON.

MEDICAL literature is strewn with the records of unassimilated observations. Each advance guard of science goes through this rubbish-heap of literature and picks out such specimens as their new conceptions of science can explain. The mass of clinical observations gradually centers about certain peaks of frequency or certain congresses of association, and out of these groupings of nebulous uncertainties real scientific deductions at last appear.

The ossified man of the dime museum held a tragic place in the nightmares of our youth and later in our scientific fancies.

Myositis ossificans is looked upon as a condition common enough to receive a section in our nosology. It is usually given as (1) a myositis ossificans progressiva, which begins in infancy or adolescence, without known adequate cause, and continues to the end of life, and as (2) traumatic myositis ossificans, which results from local irritation, and may terminate shortly in local arrested ossification of adjoining muscles. The former are the rarer in point of numbers, and more compact in point of consistent uniformity of symptoms, course and termination; the latter are more numerous and more variable. This group probably is composed of several distinct pathologic groups, which accidentally manifest the grotesque symptom of ossifying myositis, and are therefore ignorantly huddled

together in this artificial category. We find here cases of syphilitic ossifying periarthrititis and myositis, sarcomatosa fibrosa and ossifying periostitis, besides the true ossifying myositis aroused locally by injury or infection.

The clinical entity now known as ossifying myositis is looked upon as a general, diffuse, chronic or sub-acute inflammation of muscles, followed by a more or less complete ossifying process, and due to a congenital (?) fault of a mesoblastic, mystical, intangible and irremediable if not inscrutable nature. It is never hereditary, and, although its appearance does not interfere with procreation no offspring have ever been afflicted with the same condition.

Rolleston (*Clinical Journal*, 1901, v. 17, p. 209) is wholly given up to the idea or theory of an essential error in mesoblastic development as the fundamental cause of osteofying process. He holds that the same cause exists in the traumatic group, and that it is not sufficiently vicious a fault in such cases to produce the bony tumors without a traumatism, while in the progressive type it is a more serious error, and the ossification of muscles appears spontaneously and inevitably.

The fact that certain unrelated diseases, such as the acute infectious diseases, tuberculosis, and even acquired syphilis, often antedate the onset of progressive ossifying myositis,¹ seems to support such a thesis. There are many other cases reported of a similar kind.

¹ De Witt: Myositis Ossificans, *Am. Jour. Med. Sci.*, 1900, vol. 120, p. 295.

A patient that had never shown any tendency, even to osteophytes, suffers injury resulting in local ossifying myositis, and immediately there follows a progressive general myositis (Pincus, 1896). These peculiar clinical histories are complicated by equally inexplicable microscopic findings. The degree of ossification differs with the patient, and even in different patients. In one the osteophytes are largely displacements of true muscular elements, and are surrounded by fascia-like capsules; in others the bony masses include microscopic muscle elements not yet destroyed. Here there is a myxomatous tumor surrounded by spicules or capsules of bone, while near by there is a thoroughly eburnated osteophyte. The tumor which has displaced these muscular elements does not always remain detached from the bone to which the muscle is inserted or from which it arises. It then resembles the splint bones of the horse and other animals. However, the muscles of the legs are exceptionally involved, and suggest a wholly different etiology. When both extremities of the muscles are thus ossified the surrounding joint is rendered immobile.

The similarity to embryonal development found in some of these osteophytes led Virchow to assign these tumors to a category between inflammatory new growths and malignant degenerations.

Clinically, every point of attack is preceded by a distinct myositis, with local and constitutional symptoms. In the former even the skin over the muscle takes part.

The reader would naturally think of rhizomelic spondylosis and of osteitis deformans in this connec-

tion. In the former condition the intervertebral cartilages are removed, and eventually bony ankylosis obliterates all joints. In the latter, deformities are great, but the articular cartilages remain. In this connection also, leontiasis ossium would be bound to present itself, and that very mixed example of bony overgrowth found in osteoarthropotha hypertrophica pulmonum (Bamberger, 1890; Marie, 1891; Thayer, 1896). Here there is adequate pathology, but its relations to osteoid hypertrophy and calcification are not clear.

There are certain conditions in which overgrowth of bone, somewhat similar to the osteoarthropathy of Marie, are accompanied by jaundice, in which cases the hypertrophy is arrested by the drainage of the gall-bladder. Büttenmiller,² without chemically demonstrating the toxins of the cholemia, which he holds responsible, or even connecting such a hypothetical toxin with the osteophytosis, does show that cholecystostomy actually arrests the disease. The bones become normal and the patient recovers as from the callus of a fracture.

Some credible instances of resolution of the osteophytes have recently appeared in the literature. Grosskurth (1908) reports his success with fibrolysin in treating osteophytes appearing in the left arm of a soldier after a bayonet wound; and Nadler (*Deutsche Zeitschrift f. Chir.*, Bd. 74, p. 427) gives beautiful X-ray photographs to show the disappearance of extensive

2 Büttenmiller: Toxigene Osteo-Periostitis Ossificans bei chronischer Icterus. Berl. k. Woch., 1908, May 25, p. 1001.

bony masses of traumatic myositis ossificans, without any specific treatment.

In the mind of the contemplative student and clinician, the proclivity toward osteophytosis and other hypertrophic anomalies of bones stands in the category of unexplained toxemias. Just what the toxic element is which determines the onset of the myositis which is followed by ossification, our chemists have not determined. Not much can be culled on this subject from the barren chemical literature of the past two decades except disappointment (Van Noorden, "Metabolism," Chicago, 1907, Vol. iii, p. 1275). The conspicuous part that muscles play in metabolism accounts for the prominence of muscular pathology and of ossifying processes (*i. e.*, calcifying) in particular. In chronic jaundice in pulmonary disease, in syphilis and in arthritis deformans there are evidences enough of a toxic condition, which might with better chemistry be connected with the hypertrophic osteophytosis. There are doubtless often equally important results of this toxemia which we fail to see. The bony hypertrophy is too bombastic a symptom to be overlooked.

This so obvious and flamboyant a symptom of a cryptic intoxication is further associated in the mind of the contemplative student with other spectacular symptoms of equally cryptic conditions.

Alkaptonuria is a condition of abnormal metabolism in which one overmasteringly conspicuous symptom, an inky color, appears in the urine without any chemical reagent having been added to it. The practitioner finds a reaction to the acetone sugar tests, but there is

no sugar present, and the alkaphonuric is not sick. It is a life-long condition, but it is not a disease. The homogenistic acid, which is looked upon as a basis of the condition, is not accounted for by any definite error of cellular function. The problem is unsolved.

Congenital jaundice is a similar condition, which is recognized by the color of the skin and sclera. The clinical symptoms of jaundice are not, however, present, and the subject is not sick. This bizarre manifestation has been troublesome to the bearer only from the remarks, anxiety and meddlesome activities of acquaintances and medicine mongers. A policeman with congenital jaundice has been so much troubled by benevolently anxious passers-by on his street crossing that he begged to be relieved of a duty that made him conspicuous. Still the problem of congenital jaundice is unsolved.

The list of conditions which are recognized by some flamboyant symptom could be greatly extended. They furnish a promising field for chemico-physiologic study, promising the most radical extension of our horizon of knowledge and therapeutic adventure.

If these conspicuous errors of metabolism, which produce no morbidity, can be explained by the disciples of pure chemical science, then by the same methods may the etiology of myositis ossificans and rhizomelic spondylosis be solved, and the way opened for cure or prevention. Our American students who have been so successful in the applications of physics, chemistry and biology in engineering, metallurgy and agriculture, have an untried field in the diseases of uncertain origin

to which we have called brief attention, and by the same methods a great mass of morbidity and human misery relieved, which we now suffer complacently.



ALBINISM IN ITS RELATION TO MEDICAL RESEARCH.

THE albino is one of the most conspicuous of all congenital anomalies consistent with life. It is quite rare among the European as compared with some of the colored races. The negro is the most subject to this sport, and there are albinos reported from the Congo, from the Kamarun, from Hausaland, from the Sahara, from Madagascar and from Abyssinia. The fairer Europeans do not give the albino so striking a background; nevertheless, every nation and almost every large neighborhood has an albino to point to.

Among savages albinos are killed off the same as other defective infants. The Zuni cliff-dwellers, however, had in 1896 seven albinos, all but one of whom were adults (Stevenson, Twenty-third Report Bureau of Ethnology, 1902). No two of them were born of the same parents or came from the same family, and none had albino parents. These Zunis were all measured anthropometrically, and the albinos stood high in comparison with the best of the tribe.

Sicily, which stands so near Africa, seems to have a large proportion of highly pigmented people. Livi (1896) gives the proportion of brunettes to blondes as 3.8 to 2.1 among the recruits from the province of Palermo. In this province Arcoleo (1871) found 62 cases of complete albinism. They were all born of apparently normal parents. Fifty-nine albino children

were born into twenty families containing 133 children altogether. (Bateson, *Biometrika*, iii, pp. 471-2.)

In Coahoma County, Miss., Farabee observed a good many albinos working in the field (*Science*, 1903, v. 17, p. 75). On inquiry he discovered that one family had four albino children. The grandfather of these children was an albino. He had three perfectly black sons by his normally black wife. Two of the sons married negro women and had perfectly black children. The other son had two negro wives; by the first he had five normal children and one albino, by the second he had six normal children and three albinos. The albino children and the other albinos in the county were the superiors in size and appearance to the blacks.

Hyde (1892) exhibited before his classes albino twins, born of Irish parents in Chicago. They were healthy, well-developed boys.

Darwin's classical observation of two brothers married to two sisters, their first cousins, none of the four nor any of their families being albinos, must not be forgotten. The seven children produced from this double marriage were every one of them perfect albinos.

Sym (1891) observed a family of seven children that were alternately albino and normal.

Coinde (quoted by Gould and Pyle, 1900) speaks of a man who had three albino children by two different wives.

The Cape May albinos of our grandfathers' days, two of whom were exhibited in Philadelphia in the

1830's, were the children of perfectly black parents. The mother bore three black and three albino children. She accounted for the first albino by a fright she got, at the unexpected sight of a white horse, while carrying the child. When the second albino appeared she suspected her husband of some infidelity. Peace, was, however, restored by the appearance of the third albino (Marcy, *American Journal of Medical Sciences*, 1839, vol. 24, p. 517).

Among domestic and wild animals also, albinism appears. The selection and breeding of these sports has produced types that breed true. This is most obvious in white mice, white rats and white rabbits, that are perfect albinos, breeding true. Nearly all wild animals have shown occasional albinos. The sacred white elephant is presumably an albino. Albino dogs are common enough. Albino cats, opossums (Gould and Pyle, 1894), bears, wolves, skunks, crows, blackbirds, trout (Castle, 1908), carp, poultry and doves are either cultivated, exhibited or noticed in the scientific literature.

The essential hereditary nature of albinism is shown best by breeding albino mice and brown mice together. By this simple means Cuénot (1902) first attempted to discover the character of albinism and its relation to the Mendelian law. When he crossed albino with brown mice the hybrids were all brown; the albinism had entirely disappeared. He predicted that the next generation, breeding hybrid with hybrid, would be one-fourth albino and three fourths brown. This was quantitatively though not numerically the case. Then his work became clouded by unpredicted experiences.

Darbishire (1904), von Guaite (1898) and Haacke (1905) conducted similar experiments with almost similar (except in case of von Guaite) confusion of results and conclusions. It remained for Castle and Allen (Proc. Am. Acad. of Arts and Scien., v. 38, p. 603, 1902) to elucidate the tangle and place the phenomena of albinism in accord with the Mendelian law. There are certain experiences in the crossing of albinos which led to the varying interpretations now happily explained, but they are not pertinent to this essay. Suffice it to say that, as we supposed, albinism is a truly recessive character, and conforms in breeding to the Mendelian law. So far as these experiments are concerned, albinism is in the same category as other congenital malformations consistent with life—six fingers, for example.

The material for the study of albinism in man is very meager.

1. No instance of families in which both parents were albinos has, so far as our researches show, been recorded.

2. No family of one albino and one normal parent has ever had an albino child.

3. All albino children have been born of apparently normally pigmented parents.

4. Only one family of albino children (Faribee, 1903) had an albino grandparent, and that family was composed of fifteen children by two different wives, of which children four were albinos.

These findings are perfectly consistent with the Mendelian law. We must still account for the appearance

of families in which all the children were albinos (Darwin's) and other families in which one-half the children were albinos (Sym, 8).

Every case of albinism ought to be most patiently studied whenever it occurs. Gunn, A. R. (*Lancet*, 1907, vol. i, p. 908), appeals to English physicians to allow him to study the genealogy of albinos that they may recognize. In America there is a mixed population which ought to furnish an unusually rich field for this study, and the local practitioner can hardly offer a more welcome contribution than an extended genealogy of a family in which albinism has appeared. In Mississippi, where the negroes are tainted with albinism, an unusual opportunity presents to add materially to our knowledge of heredity. It is by such means and such publications that the confused ideas held by many medical men will at last be cleared up.

Senility is ostentatiously marked by the disappearance of pigment in the hair and skin. Many imbeciles are prematurely gray. There is a high percentage of albinism of the retina among the insane. Is there also an absence of pigment in the brain of the senile, in the insane and in the feeble-minded?

The frequent association of albinism and deafness in cats, and the appearance in the same individual of deaf-mutism, spinning idiocy and albinism leads Karl Pearson (1910) to consider the existence of some causative relation between them.

There are but two cases of complete post-mortem examination of albinos. Buzzi (1783) and Adler and McIntosh (1910). Buzzi was too early for histologic

examination. In Adler and McIntosh's case the brain, the internal ear, the sclera, the iris, the choroid, the skin, the hair and all other parts of the body were completely devoid of pigment.

There is still one view of albinism which deserves consideration. Cuénot, from some experiments which he contrived, was led to believe that the pigmentation of the body was due to a chromogen and a ferment, and that albinism resulted from the absence of either. Mudge (*Journal of Physiology*, vol. 38, p. 67) says Miss Durham has extracted from the skin of young animals a substance which, when incubated with tyrosin to which a small quantity of ferrous sulphate is added to act as an activator, throws down a pigmentary substance corresponding to the color of the animal. Durham also finds a ferment in the skin, which she calls tyrosinase, which produces a pigment when acting on tyrosin. Arguing that fermentation is an oxidation or reduction, and assuming that the skin of the albino does contain a chromogenous body which only needs an oxidizing body to change it into a visible pigment, Mudge placed white rats in a 10 per cent. formalin solution of 70 per cent. alcohol, and developed in the hair a vivid yellow, which became brown in a bath of H_2O_2 at the end of twenty-four hours. The same process produced analogous results with white mice. (*Ibid*, 1909, p. 17.)

This experiment is very suggestive, at least. In myositis ossificans progressiva we have a congenital condition apparently of a chemical nature (a metabolismopathy which is so rare and disastrous to life that

procreation and transmission are unrecorded. Congenital jaundice is another harmless but conspicuous condition in the same category. Alkaptonuria is still another. In hemophilia a congenital error of a biologic and chemical nature is manifest, which, on account of its dramatic manifestation (hemorrhage), has been long and well studied in its clinical features, and is now claiming the energy of the new chemistry. It is to urge the extension of the same methods to other congenital conditions that this essay is written.

Even the possibility of a therapeusis for congenital conditions like myositis ossificans, albinism and hemophilia should not be despaired of by the prophets in this captivity of modern pessimism and therapeutic nihilism. The late J. Nevins Hyde (1892), when he exhibited twin Irish albino boys in his clinic, suggested the transfusion of blood from pigmented persons. It may be that the negro has a larger increment of the pigment ferment in his blood, and that it could be utilized.

The artificial or acquired leukodermas furnish auxiliary material for study in this connection, and cannot be neglected. The leukoderma of arsenic poisoning is evidence of localized chemical action.

A great mass of the literature of albinism is found in the ophthalmic serials, but the specialist has been overattentive to the eye, which suffers most from the absence of the choroid pigment.

No congenital anomaly lends itself so readily to the conditions of laboratory experimentation and obser-

vation as albinism, and its study can hardly fail to yield unforeseeable educational, eugenistic and therapeutic fruits in due season.

THE EXPLOITATION OF THE MYSTICAL IN MEDICINE.

It is not often that a more subtly pernicious article appears in the lay press than one in the *Ladies' Home Journal* of October, by a Baptist minister who has an unusual command of language and rhetoric. He told how he was hit on the head and suffered concussion of the brain of only a few hours' duration, and then came out of a "dual state," which made it necessary for him to learn over again all physical, mental and spiritual things, but gave him at the same time the power to learn with a celerity unequalled by anything in his or our experience. After he had learned an indefinite number of languages, spending only a few hours at each, as the normal child spends only a few months at each, he with great labor (obstetric, not economic significance of this word) brought himself back into his normal personality, in which, he asserts, he has uninterruptedly remained ever since!

To us it is one of those cases of hysteria following head injury, which was referred to as exceptional by us in our paper on "Mental Aberration Following Injuries of the Head," which was read November 22 before the American Association of Railway Surgeons in Chicago. It is a curious misconception in the lay mind that insanity follows injuries of the head. It does, but in so small a proportion of cases that it must be looked upon as a precipitating event

rather than an adequate cause. One out of every four hundred citizens is eventually declared insane. Not one out of fifty of the population of our insane asylums gives any history of injury of the head.

Concussion of the brain is often followed by hysteria, which in the case of our Baptist minister approached a grave condition. He appears to us to be not far removed from many other cases to be found recorded in the medical literature. In the article referred to we recited one case marvelously cured by our suggestion. Clarke¹, Janet² and Amselle³ give numerous cases illustrating at once the various traumatic sources of hysteria, and especially the forms of hysteria following immediately on concussion of the brain. The close relation between epilepsy, hysteria and insanity, and the uniformity with which a great trauma brings these hidden conditions into evidence, is abundantly illustrated in these books.

Injuries of the head are followed by disturbance of cerebration, sometimes apparently productive of good sense, but generally of the contrary condition. The habit of railway claim agents in securing release papers from injured passengers and employees at such times is distinctly unethical and would not be smiled upon by an enlightened judiciary. The "specialist," *e.g.*, the alienist, is at a distinct disadvantage in the short

1 Clarke: "Hysterics and Neurasthenics." John Lane, London and New York, 1904, 8vo, pp. 298, v. 247-260.

2 Janet: "The Major Symptoms of Hysteria." MacMillan Co., London and New York, 1907, 8vo, pp. 345, v. 138-159.

3 Amselle: "Conception de l'Hysterie." O. Doin, Paris, 1907, 8vo, pp. 297. V. Bibliograph, pp. 287-297.

time he has his patient under observation. The surgeon who finds an insane, an epileptic or a hysterical patient who has passed into one of these conditions after an injury of the head, is too apt to look upon the trauma as an adequate cause, and seek to cure the disease by the almost sacerdotal trephine. In the *furor operandi* of the last quarter of a century many wounds of heads were made, which heads are now found in the institutions for the epileptics and for the insane, and soon will be preserved in our burial grounds, to the great confusion and wonder of the archeologists of the future society which may arise after our civilization and its literature are destroyed.

But the greatest lesson to be learned from the little minister's autobiography in Mr. Bok's popular paper is the insatiable hunger and thirst of his readers for the mystical and the mysterious in human life. If he had been cured by Swamp Root, the little minister's testimonial would not have been half as pernicious, though perhaps twice as remunerative. However, the audience that takes to all manner of pseudo-sciences, such as the "conquest of cancer," "eugenics," "Fletcherism," "Kneip's nature cure," "Christian science" and "Emmanuel movements," will be further confirmed in their belief in the superscientific by this artistic bit of pathological romance.

In these times let us suggest that every doctor add to his litany the following invocation: "From all inexplicable psychological manifestations simulating disease, which befall our patients; from all unreasonable, mysterious and mystical, though entertaining and in-

spiring, theories of cure, whether attended by a pitiable paucity of poor and ignorant followers or by a magnificent scintillation of moving masses of gorgeously bejeweled pageantry, good Lord deliver us."

THE FEEBLEMINDED.

IDIOCY is so terrible an affliction that it has from earliest times had legal and social recognition. It is due to one of two causes, a *germinal variation* on the one hand, and a *bodily modification* on the other. In the former case, it is inherent in *nature*, hereditary and conceivably transmissible; in the latter, it is *nurtural* and no more significant phylogenetically than a broken bone.

Fortunately, the great bulk of the congenital idiots die at birth or during the mortality of the first weeks of life usually from other congenital defects, and the small number remaining are segregated and prevented thereby from any possibility of reproduction. The early death of the congenital idiot and even the idiot from the result of disease or accident is apt to occur, before the suspicion even of the family is aroused by the tardy mental development. In the tremendous mortality of infants during the first weeks of life the exact proportion of potential idiots has not been determined.

It is, however, quite another condition which is termed feeble-mindedness. In a primitive state of society this condition would not be so serious a handicap. It is not always attended by feebleness of body. It is a condition both of germinal variation and, therefore, transmissible by the Mendelian law, and of accidental bodily modification and non-transmissible. This condition, which is the result of congenital malforma-

tion, on the one hand, and of disease or injury on the other, known as feeble-mindedness, finds only tardy recognition in the monuments of philanthropy and the annals of our statute books. The word feeble-minded itself, with its technical meaning, is of so recent use that the more pedantic place a hyphen after the adjective portion to separate it from, rather than connect it to, the substantive part. Indeed, we may search the statute books in vain to find what provisions have been legally made to guide the courts in their conduct toward this growing class of citizens. In a few instances a finical legislature has used the word feeble-minded as synonymous with idiot when framing the title of its laws, but an analysis of the subjoined statute discloses a failure to consider the feeble-minded, properly speaking, at all.

The feeble-minded embrace that class of the community deficient in intellect, but not idiotic, deluded or epileptic and not subject to commitment or any legal restraint or recognition. They are capable of productive occupation, but are unable to hold their own under competition. They lack judgment.

This feeble-mindedness is sometimes the result of injury or disease or of improper, injurious and destructive treatment, or neglect of treatment for injury or disease; of defective or deficient feeding and housing; of the destructive workings of the factory system or of child labor; and of the ravages of the social evil and its attendant dissipations. In so far as feeble-mindedness is the result of post-natal causes, it is an accidental defect or bodily modification of no more

phylogenetic significance than the loss of an arm or a leg. Scarcely a fanatical advocate of the hereditary origin of every disease, from albuminuria and appendicitis to the "yellows" and zoster, can be found who would legally inhibit procreation on account of the fear that a parent would convey to his offspring an amputated extremity or a gold-crowned tooth. Even those cases of feeble-mindedness in which the Wassermann reaction shows a syphilitic pre-natal basis are only transmissible so far as syphilis is transmissible to the offspring, and the child of such a feeble-minded parent is no more likely to be feeble-minded than he is to have a syphilitic bone or hepatic gumma. It is still too early to learn the benefits of treatment of hereditary syphilis, discovered in the first weeks of life by hemolytic reaction, in preventing the baneful effects of this disease on the cerebrospinal system.

Just how large a portion of the feeble-minded are in this unhappy and, to us, shameful condition as the result of post-natal accident, starvation and abuse, or of other non-transmissible causes such as hereditary syphilis, tuberculosis or ancylostomiasis no commission has ever attempted to determine. We may safely and indisputably affirm that in so far as infants are properly fed and cholera infantum prevented; in so far as the epidemics of the acute infectious diseases are limited or arrested, and the sick of these diseases so rationally treated as to prevent the onset of dangerous complications and mixed infections; in so far as childhood is protected from the piratical manufacturers' relentless machinery and inhuman toil, the benumbed and

paralyzed condition of mind which we term feeble-mindedness will be proportionally diminished.

There is a remnant of the feeble-minded that is such from congenital defect. They are not "inferior members of a normal mankind." "They suffer from a deficiency of mind, a failure of mental development, which is of precisely the same kind as and merely differs in degree from the states of imbecility and idiocy." Although this lamentable condition may be ameliorated it can never be cured, and such feeble-minded person turned into a normal individual. It may be assumed to be an accidental variation, therefore transmissible, according to the Mendelian law, to succeeding generations. In these congenitally deformed, procreative power and sexual pertinacity seem to be early and irresistibly developed. A. F. Tredgold has found such feeble-minded are actually, even under the unfavorable surroundings of modern economic restraint, one and a half times more prolific than the normally intelligent. In this way does nature express a determination to perpetuate any accidental variation, even though our present judgment is that the strain is unfit. Sixteen feeble-minded mothers gave birth to 116 children, and in one family of fourteen only four were able to do remunerative work.

In the rush and hustle of our American business and professional life, there is little time for that wisdom that comes from contemplation. The doctor of medicine must, however, take a hunch of the times and wake up to the surroundings which are leaving a heritage of woe to the coming generation. The

sacrifice of our forests, our public domain, our water power and our mineral resources by extravagant and ruinous exploitation at the hands of organized commercial bandits and pirates is not more hazardous to the happiness of the next generation than the neglect of the orphan, the feeble-minded and the other defectives.

It is the duty of the economist citizen to furnish a conscience to the State in its relation to fuel, lumber, water and transportation, and it is an equally imminent duty of the doctor to warn against the danger that the State may lose that grand resource for which all others are conserved, namely, a vigorous and unblemished citizen body. To do this he must combine the most intimate and familiar knowledge of the exact sciences and a healthy experience in the affairs of State, village and family. Fortunately, in the many aids to knowledge and culture which libraries, journals and monographs now afford, such a near-Utopian condition is possible. The whole subject of heredity is presented in a perfectly readable and intensely fascinating manner by J. Arthur Thompson in his book of that name (G. P. Putnam's Sons, 1908), and the eight blue books of the Royal Commission are now at hand and give a detail of information of world-wide conditions which deserves the attention of every good citizen doctor.

It appears that the ratio of feeble-minded to the normal is about 1 to 120. In every school of 1,200 pupils there are at least ten feeble-minded children; in every city of 120,000 inhabitants there are 1,000 feeble-

minded citizens; in this great nation of nearly one hundred million people there are nearly 830,000 persons "*who are capable of earning a living under favorable circumstances, but are incapable, from mental defect existing from birth or early age, of competing on equal terms with their normal fellows or managing themselves and their affairs with ordinary prudence.*"¹

Like any machine of human construction, the law requires to be fed with a standardized product. In its application, "a man's a man;" the fact that he is feeble-minded is not pertinent. During the last century the lunatic has been legally extruded from the hopper of the courts by the commitment device. Not so the feeble-minded. All students of feeble-mindedness recognize the almost equal responsibility of the lunatic and the weak-minded. The Royal Commission found that 20 per cent. of the criminal population of Great Britain were mentally defective, and at least 10 per cent. of the tramps were feeble-minded. *Almost half of the girls in the brothels were feeble-minded, and some were almost idiots.* Yet in the workhouse these women were very prolific, and even when married their sexual overdevelopment was so great that more than half of them "led immoral lives." One hundred and fifty pairs produced at least 328 offspring definitely diseased in mind or body. The cost of each feeble-minded person to the commonwealth was estimated by the commission at about \$10,000.

One of our first duties is to inform the public of the condition of feeble-mindedness and secure laws recognizing this state in which 1-120 of our

population belong. The indulgence of the law to this class should be legally vouchsafed and the inhuman action of the police toward feeble-minded offenders should be stayed by statutes. The civil rights of the feeble-minded should be curtailed and a public conservator should be provided in every community to protect them from normal citizens, or, where economic conditions demand, a private conservator should be possible. Those feeble-minded who are such from prenatal, transmissible causes should be segregated permanently and procreation should be prevented. This is especially necessary in the case of feeble-minded girls whose only avenue of self-support is the red light road.

There are good reasons why all the feeble-minded should be treated with the greatest consideration and almost worshipful gentleness. The elimination of some phases of intellect exposes the emotions, the passions and even that mystery, the imagination, to unexampled prominence. As we learn from comparative anatomy and physiology, so we should learn from these adult children. Such was Darius Green of the flying machine, a prophet of the Wright brothers' aeroplane. The spirit of St. Francis of Assisi was exhibited for the world's admiration and edification by a feeble-minded man "who was incapable of managing himself and his affairs with ordinary prudence." The spirit of modern child study and fundamental education has been largely assisted by the study of the mental processes of the feeble-minded. Every person who has had to do with the feeble-minded is dull indeed

if his spirit is not ripened and mollified by the experience.

The trades unions should become thoroughly informed of the significance of feeble-mindedness to the labor problem. In the labor market the feeble-minded are ever at the mercy of "the meanest employer." The fact of feeble-mindedness does not interfere with production in many occupations of the modern industrial system. The machines are made so simple that any fool can run one and they are made so strong that no fool can break one. And it is this army of less than 1 per cent. of laborers that capital uses to break each succeeding strike. Without the wit to protect themselves they are collected from hither and yon and when the strike is over they are thrown out for better men.

The Royal Commission estimated that each feeble-minded person cost the State sooner or later, and before he was under ground, not less than \$10,000. In the whole United States this means a good round sum, enough to build a battleship or endow a university or even a medical school now and then. Capital, so prone to protect itself, should protect itself from taxation for this item of the annual budget. These defectives are capable of productive labor, but incapable of playing the game called "the competitive system." Those who fear the coming of Socialism should stay the grind and squeak of competition by caring for this disturbing element.

Educators have already demanded and secured separate schools for backward children. When the backwardness is due to peripheral defects in carrying

communications to and from a normal brain, the teachers have done wonders. They must not, however, be required or expected to accomplish the miracle of making the feeble-minded strong-minded or normal. Helen Keller had an imprisoned normal mind of great alertness. Her education was simply a process of opening doors. Each State has its Helen Kellers, and some of them are educated by the liberal legislative appropriations of a prodigal people. The presence of the feeble-minded in public schools is embarrassing to the teacher, disturbing to school discipline and unprofitable in its results. The diagnosis of feeble-mindedness should be made early by the exclusion of peripheral retardation of apperception, and its etiology should guide in the subsequent disposition of the unfortunate. Under proper guidance, a simple rural life, almost a life of savagery, in its etymologic significance, would be humane, rational and economical, and save the police, the courts and the philanthropist much futile activity.

OUR LESSON FROM THE HOOKWORM.

A MOST widely read and cultured physician expressed to us the opinion that every insane person was in his dilemma by the natural result of his own unreasonable ideas and the reasonable conduct following the entertainment of those ideas. He expressed the utmost horror at any association with these miserable creatures, and pooh-poohed the notion that any intoxication or other "somatic" cause lay at the bottom of the insanities. After considerable argument he reluctantly allowed that alcoholism precipitated delirium tremens and some cases of so-called alcoholic insanity; that syphilis or alcoholism or both preceded most cases of general paresis; that pregnancy and parturition were the antecedents of puerperal insanity, and that certain poisons seemed to initiate insanity in a few individuals; but that the bulk of the insane went "batty" because they entertained irrational or twisted ideas.

It was a distinct shock to us to find so medieval a philosophy in such a representative person. All our education since Newton, Boyle, Tyndall, Darwin, Koch and Ehrlich began to influence medicine, has been toward the rational, the natural and the consequential cause of all phenomena, making no exception of those of the human mind. We find, however, that the maladies of more than two hundred thousand of our fellow citizens are placed by a most respectable and influential portion of the medical fraternity to the credit, not of the devil ("possessed of a devil"), not of the

moon ("lunatic"), but to the credit of the twisted idea.

If one will try and put himself in the other's place and learn, it may be possible that we can agree.

Some of our leaders in the custody of the insane insist that unless we acknowledge the boundary between mental and physical disease, and can distinctly limit each, we are hopelessly out of all consideration and beyond the jurisdiction of reason. (Mercier, *Journal of Mental Sciences*, July, 1910, p. 407 *ad fin.*)

Mercier elsewhere insists as if it was an acknowledged fact that "insanity is a disorder of the mind" (*loc. cit.*, p. 408, line 22), and then modifies the assumed general consensus of opinion by contending that "insanity is a disorder not alone of mind but of conduct" (*loc. cit.*, p. 409, line 6, also lines 15 and 35). This same authority, who represents the conservative and satisfied alienists as well as any single man that we can pick out, further says: "The universe of matter and motion lies on one side of a gulf, and the universe of mind lies on the other. The gulf is bottomless, and its width and length stretch to infinity" (*loc. cit.*, p. 411, lines 30-32).

To us no more senseless, mystical and unscientific statement can be imagined than this, but as it went unchallenged before a body of English alienists who showed themselves quite free to criticize the author in many other directions, it is likely that it coincided with the opinion of those who attended the meeting of the Medico-Psychological Association of Great Britain and Ireland, in London, May 24, 1910. In other words, we must accept the apparent fact that those most in-

timate with the insane, and those who profess to have studied the problems of the insane from every standpoint and in a scientific manner, assert that one side we have the body and all its diseases, and on the other, separated by an immeasurable gulf, is the mind and its disorders, among which are the insanities. This is the line of battle to-day.

The great bulk of the medical profession and all the laity have scant opportunity to observe the insane. By the unanimous custom of modern society, at the first evidence of mental aberration the patient is haled before a court, declared a lunatic and placed in a hopeless custody. The legal proceedings are similar to criminal proceedings, except for the most part there is no devil's advocate. This method also adds to the terror-breeding associations of the insanities in the mind of the common people.

When one undertakes to support by argument a proposition that he considers axiomatic he is in a very unfortunate position. We sympathize with him now. To us there is no mind separate from the body. We see the mind deranged by alcohol, by typhoid, by syphilis and alcohol, and by old age, acting, as we believe, on the body. It seems to us that other aberrations of mind are likewise the result of bodily disorders. The fact that such is the case has perhaps not yet been demonstrated. It is, however, easier for us to look forward to a future demonstration than to change our conception of the unity of the whole system of nature and separate mind from matter by an impassable gulf.

We console ourselves in our lack of argument by the

accumulating evidence that the insanities are of toxic origin. Even neurasthenia is coming into the fold of tangible, somatic, demonstrable physical diseases. (Page, M., *Le toxémie neurasthénique*, Paris, 1910, octavo, p. 256.)

One by one the mysterious diseases of the nervous system are discovering their complete simplicity on the interrogations of relentless experimental and clinical methods. Cerebro-spinal meningitis furnishes not only its own solution, but its own cure. Infantile paralysis has at least discovered its infectious nature, and soon its mastery by science will surely be brought about.

In this connection the recent study of infantilism by Lemann (*Arch. of Inter. Med.*, August 15, 1910), has interested us much. The patient under examination was a boy, twenty-two years old, that contracted hookworm disease when an infant and never developed into manhood. The pubic hair and peculiar skin so characteristic of maturity were absent, and the X-ray showed an equally infantile condition of the skeleton itself. Unfortunately, the investigator paid little attention to the mental condition. The mind should mature with the body and remain childish with the child's body. Not until one becomes a man does he put away childish things.

The intimate relation between the mental and physical condition of patients suffering from hookworms was early and often pointed out. Greene's classical studies of the condition of the insane in Florida puts another question to us: "Does hookworm toxemia produce any of the insanities, and are recoveries possible

when the parasites have been driven off?" This question has received an answer in the report by Austregesilo and Gotuzzo (*Arch. f. Schiff. u. Tropenhyg.*, vol. 13, p. 339) of three cases of insanity that recovered as soon as the thymol therapy had been successfully applied. The authors express themselves positively as believing the mental aberrations were caused by the worms, that they were symptomatically cases of insanity, and that they recovered with the expulsion of the worms and on that account alone.

We should like to know just how thoroughly the hookworms have been eradicated from the hospitals for the insane in the South, and how many recoveries of the insanities have resulted. The fact that one-third or more of the insane harbor hookworms in all the Southern hospitals for the insane means little when we are reminded that probably at least one-fourth of the well-to-do citizens of the South are infected. Gage and Bass (*Archives of Internal Medicine*, vol. 6, p. 361) showed that medical students in New Orleans were infected to at least that extent, and that one-third the students residing in New Orleans harbored the parasite.

The old-fashioned madhouses were full of bedbugs, cockroaches and rats, and the patients had the itch and other parasites every winter at least. Now the hospitals have many patients with hookworm disease, pellagra, and tuberculosis. The hospitals have improved by the elimination of some of their parasites.

Our contention is that the insanities are the result

of physical disorders which are susceptible to scientific study and ultimate prevention or cure.

In the United States with a population of more than 80,000,000, 150,151 were confined on December 31, 1903, in asylums for the insane. The annual expense to the States was \$21,329,228.41. These expenditures have been minutely studied and analyzed but neither the census office nor any public officer has reported any appropriation or expenditure designed to aid in the discovery of the causes of insanity or of its prevention.

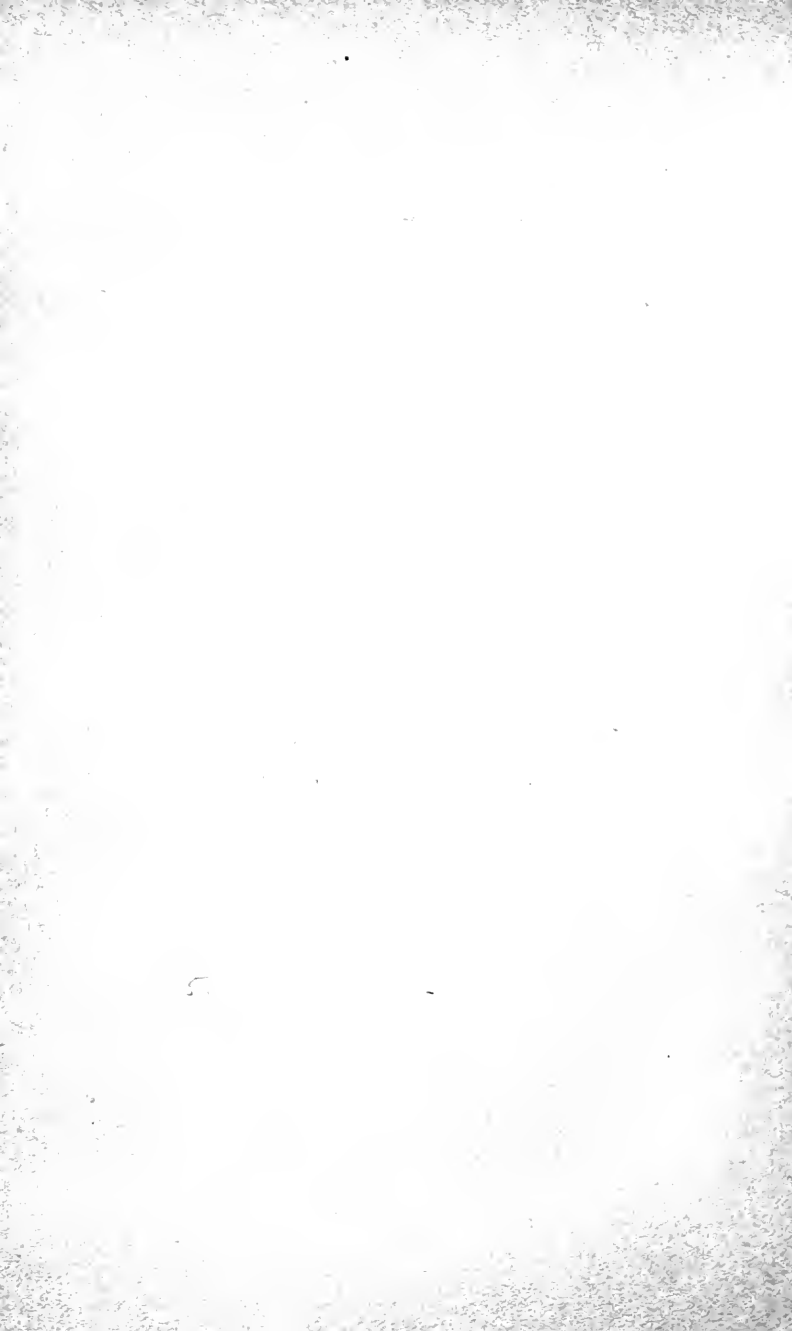
It is our contention, not from argument or reason, but from analogy and the irrepressible credulity of the human soul, and an unbounded confidence in the resources of human ingenuity, that the insanities are due to discoverable, preventable, even curable natural physical causes and that the least of these is the toxemia of the hookworm.

The States should maintain a laboratory of research into the causes of the insanities. At least 5 per cent. of the custodial expenses should be expended under the direction of the University in research. With forty sovereign States and the competition and rivalry between forty universities engaged in one worthy task much advance into the dark and grewsome continent of our ignorance would surely eventuate.

We have long passed the stage of civilization in which the insane were hunted like wild beasts, and punished as possessed of devils or caged and shackled like untamable animals. Now we house them gently until they are dead, dead, dead, of the conditions and diseases that result inevitably from our custody. How

long will it be before we study our insane as we study other human ailments and seek a cure as we have successfully sought in the case of syphilis and diphtheria?

In way of humility let us give all credit to the great army of alienists and humanitarians who, under the most disheartening opposition, have brought our mad-houses to a condition in which we dare call them hospitals. They have done a good work, but it is only a beginning. Now for the sapping and mining of the entrenchments of ignorance of the causes of the insanities, to the end that they may, like cholera infantum, typhoid and smallpox be prevented and cured—a task worthy the soundest body, the keenest mind and the most embracing soul.



THE LESSON FROM VETERINARY MEDICINE.

THERE are at least two distinct methods by which Brother Rabbit and Brother Ass even, may help us out to solve the problems of disease of obscure etiology. At the present time we are looking intently toward experimental diseases of animals produced in the laboratory and studied in the test tube and under the microscope. We must not, however, forget the greater sphere of possible analogy in the diseases of animals as they are discovered to the veterinarian in the laboratory for preventive animal disease.

The remarkable utility of serologic diagnostic methods is happily illustrated in a few cases selected from recent veterinary literature. A large number of agglutinative tests were made at the pathological institute of the veterinary high school in Berlin, 1907-1908, and elsewhere in Prussia, upon animals suspected of glanders. In one series, seventeen hundred and fifty horses were tested, of whom two hundred and eighty-three were destroyed or died; one hundred and seventy-seven were found at the post-mortem to suffer of glanders; sixty-nine were killed for other reasons.

The ease with which the agglutinative power of the blood can be measured in animals and the large number of animals under prolonged observation make these studies of unusual significance in contriving similar methods for the clinics of obscure diseases of man. The variation of agglutinative power in the healthy

animal is demonstrated to be slow and small; in the sick, however, the variations are tremendous and rapid. It was considered a distinct indication of disease that these peaks of variation appeared and they placed the animals under a suspicion which made more extensive and exhaustive study appear more reasonable to the owners of the studs.

Agglutinative tests have been made in cattle of certain districts affected with epidemic contagious abortion. This disease, so disastrous to dairy interests, can be recognized afar off (five months) by this method and the afflicted animals can be removed from chance of infecting the herd and the abortion awaited under conditions most favorable to the recovery of the unfortunate animals. Here also the appearance of agglutination and its variation in the same animal presents material of extreme value hardly to be looked for in hospital and private practice among human beings. The long time after the appearance of agglutination before the obstetric event which infects the barn, the yard or the field, gives us hope for possible parallels in human diseases.

In Cape Colony cattle suffer of a peculiar disease known as lamziekte. It produces death by two methods, an acute and a chronic process. When acute the animal quickly succumbs to a fulminating infection and the carcass swells up, the tissues give off an unmistakable and characteristic odor, which has been compared to that of tissues necrotic through extravasation of urine. In the chronic disease the animal slowly dies of nervous, asthenic manifestations—stiffness, lame-

ness, trembling, paralysis and other symptoms simulating milk sickness so common in the Mississippi Valley twenty or thirty years ago. Strange enough this disease made its first appearance in Cape Colony in a district which has been noted for cattle raising for many years. It appeared about 1879 and gradually spread until the herds were ruined and other occupations and industries took the place of cattle raising. The herds are hardly able to keep up their numbers and many farms are entirely without animals. It is possible through the work of William Robertson to say that artificial immunity for this disease is at hand and that the detection of the disease in advance of its onset has already attained commercial utility.

The acute infectious septicemic disease of horses known as strangles seems likely to come under the sway of an artificial immunity. Schultz, in 1888, discovered the cause of this disease in a streptococcus. Desouvry and Dassonville have recently evolved a serum or series of sera which they have used in a great number of epidemics of strangles with increasing success. At the present time it is possible to keep a stud in such a condition that the horses and colts will not furnish a basis for epidemics of acute strangles, and susceptible only to mild forms of the disease. In this respect the condition is similar to that of communities vaccinated against smallpox. Sporadic cases are bound to occur in unprotected animals and unfortunately the sera have so far been found of little avail in ameliorating such disease or cutting short its course.

These illustrations, taken of a single method and

almost at random, show how professional veterinarians have utilized serologic methods for diagnosis, for prophylaxis and for treatment.

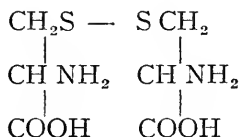
The economic value of each advance in diagnosis is guarantee that it will be quickly utilized, and the increasing value of experimental herds and studs limbers up the cattle raising interests to a liberal appropriation of money and an acute economic recognition of technical ability. The most valuable contribution to medicine in the United States during the past twenty years is without any doubt the mastery of the hookworm disease. It only awaits as vigorous rational and generous methods of application of our knowledge to this disease of man as has been applied to diseases of animals in order to open up the empire of the southern South to as great a prosperity as that which attended the north central States forty years ago.

To read the literature of comparative medicine as it comes forth from the veterinary laboratories makes us feel that we are extravagant beyond all measure in permitting the diseases which place two hundred thousand good citizens in the custody of our madhouses, where they are herded at great expense and with a devastating mortality, without the slightest concerted or sporadic effort to seek for the physical causes of the diseases of which insanity is the symptom.

CYSTINURIA, DIAMINURIA AND ALKALONURIA.

THERE are three derivatives of protein which are of only slight clinical significance, but of extreme theoretic and prophetic importance. When we read the marvelous chapter of these strange manifestations we look forward to analogous demonstrations of symptom-producing errors of metabolism, the excretory signs of which are not yet recognized and associated in our minds with symptoms which have received clinical appellations.

Cystin is composed of a combination of sulphur with hydro-carbons and nitrogen, and has the complicated formula :



This substance alone, of the three here considered, contains S. The diamines are much simpler in construction, and are known as putrescine, tetramethylene-diamine and cadaverine, pentamethylene-diamine.

The alkapton bodies are hydroquinones or hydroquinone-acetic acid. The basis of these bodies is homogentistic acid.

Clinically, small quantities of cystin are found in the urine in acute yellow atrophy of the liver, phosphorus poisoning, diabetes, gout. pneumonia and some other

infections. But this does not amount to a cystinuria. The persons who have cystinuria rarely make any complaint, and the condition is accidentally discovered. Six-sided tables of cystin, which do not dissolve in alcohol, ether or water, are found in the alkaline urine; or, after presenting cystin-bearing urine unnoticed for years, a calculus of cystin may make trouble anywhere in the urinary tract, from the calyx of the kidney to the meatus. The amount of cystin in the urine of these sports of metabolism is as much as twenty-five grains a day. There is no other evidence of the excretory error. Males and females are about equally affected, and no time of life is exempt. Even intra-uterine cystinuria has been observed. It seems to be "in the family," being observed during three generations, and in more than one child of the same parents. Unfortunately, this manifestation has not been studied in the light of the Mendelian law. and cannot therefore be pronounced an hereditary and transmissible feature.

Cystinuria is a fleeting condition, going and coming without known adequate cause. It frequently disappears with appropriate diet. One would expect it to disappear always on a protein-free diet. It does not always do so.

When cystin and other monamino-acids are taken by normal persons by the mouth, they vanish as such absolutely, and no trace of them is found in the urine, but when given to the cystinuric they appear in the urine unchanged in quantity or quality.

The cystinuric often excretes putrescine and cadaverine in his urine also, and these products of bacterial

life may be made to disappear without any change in the cystinuria. The presence of these diaminës is irrelevant and negligible.

The cystinuric is unable to completely dispose of his proteins and eliminate them as urea and sulphates in the urine, or to throw off the sulphur through the bile.

The appearance of cystin in the urine in phosphorous poisoning, and in the analogous acute yellow atrophy, has been greatly illuminated by experiments with halogens combined with the benzene radicle. The results of these experiments seem to show that cystin is a product of incomplete metabolism rather than of any bacterial excretion.

Diaminuria, however, is evidently due to bacterial decomposition of proteins. It may also be an error of metabolism. It is a hydro-carbon anomaly, which clinically is often suspected by the smell of the breath and perspiration, and may be relieved by such methods as prevent the decomposition of the contents of the intestinal tract.

The diamines are suspected from the odor which they give the urine, but they may be demonstrated only by exact chemical methods (Simon, Marriott and Wolf).

* * *

Alkaptonuria is an extremely rare condition, recognition of which depends on the bizarre symptoms of black or inky urine, or at least of urine that turns black soon after it is passed. The alkapton body (hydroquinone acetic acid) gives a precipitate on applying

the copper sodic hydrate sugar test, but does not on applying the fermentation test. Thus some cases are discovered among adults by examinations for life insurance. It is often a congenital condition, and the discovery is then made by the inky stains on the diapers. The chromatic elements are deposited on the ear-drum, in the ear-wax and in the articular cartilages.

The quantity of alkapton excreted daily varies between 45 grains and 250 grains! This is an enormous amount, and yet, so far as we know, the subjects are perfectly well.

These three conditions are recognized and therefore have been studied, because of an unmistakable finding in each; namely, in cystinuria hexagonal tables insoluble in alcohol, ether or water; in diaminuria the offensive odor of the urine; and in alkaptonuria the inky color of the urine on standing.

* * *

What interest can these three sports of excretion have to the busy doctor? Why in the presence of more important problems be diverted to these bio-chemical curiosities? The moral is not far to fetch. Let us take but one of a number.

Here are three conspicuous abnormalities of metabolism without morbidity. In dementia precox we have morbidity of the most serious and lasting kind without any known cause. The breath and urine are loaded with acetone and other aromatics, but there is no diabetes or starvation. The skin pours out abnormal sebum and the intestines pour out mucus, but there

is no recognized cause. The tendency to relapse is conspicuous, but no one knows what initiates the exacerbation. The blood shows a marked leucocytosis, but the vaccines used and agglutination tests tried have not been interpreted scientifically. The cobra venom produces a peculiar hemolytic reaction, but no immunization has been accomplished.

Nevertheless, here is a weak place in nature's abatis of mystery about the aberrant mind which should be charged with all the force our imperfect biochemical science can command. Some Koch in his mountain fastness, some Pasteur in his obscure lecture-room, some Ehrlich in his systematic laboratory may do the trick that will open the doors of the madhouses to the most unfortunate of youths.

THE INSTITUTIONS FOR THE INSANE — CUSTODY OR CURE?

IN our country public service follows public opinion. How often, in speaking to physicians and educated laymen, has the fact that, of the \$25,000,000 spent annually by the forty sovereign States in the care of the insane, not \$25,000 is spent in the study of the causes of the diseases of which insanity is the overpowering symptom, aroused unstinted astonishment? It is not credible that so much bounty is given to the custody of the lunatic and not one-thousandth to cure.

It is said by many that insanity is on the increase. Statistics from every State in the Union and from every civilized European State show an appalling increase in the number of incarcerated insane. The higher the civilization the greater the proportion of the committed.

It is said that among the more barbarous people, such as the Turks, insanity is much rarer, and among the Turks the Christian (alcoholic) suffer more than the Mahommedan (polygamous).

It is further affirmed that insanities are a constant accompaniment of European civilization, and that they are rarely observed among the Mongolians (E. Myer). There is only one insane asylum in China!¹

¹ Mullowney: The Need of a Hospital in North China for the Mentally Diseased. China Medical Journal, January, 1911,

In India insanity prevails to a considerable degree, but the conditions make it impossible to judge how frequent it is. Certainly it is less prevalent proportionately than in Europe and America.

When we look the matter in the face, we see that insanity, like many another human ailment, increases apparently with the consideration given the condition. It is likely that since the time of Saul the ratio of the insane has increased with knowledge, with humanity and with brotherly love.

It is within the memory of our grandfathers that the insane were first provided an asylum in this country. How dreadful their condition before that time we cannot conceive—we do not wish to contemplate. Through the labors and the devotion of an army of humanitarians, the States one after another built and conducted great institutions into which the insane were collected and are kept.

When the insane were in the poor-houses, jails and private pens with which our ancestors were familiar, the custodial institution was the ideal of all reformers. Our memory goes back to a garden spot in northern Illinois, in 1875. A wealthy farmer, with large and full barns and a fine house, built a pen in his apple orchard where he kept his insane son, and it was our misfortune to stumble upon it. The horror of the place has never left our memory, and comes up after more than thirty years in our nightmare dreams.

vol. 25, p. 28: "Finally, if the signs of the times do not deceive us, this class of diseases (of the mind) is on the increase among the Chinese, and we must make some provision to take care of them properly."

At the present time the campaign against the county care of the insane has terminated in a surrender by the county grafters. The end, however, is not actually accomplished. A few States still *promise* to remove the insane from the county to the care of the State in a year or two. Even belated Wisconsin is ashamed of the county custody of the incurable insane, and is making strenuous efforts to organize the whole system upon a rational, remedial, educational basis. Before the present legislature there is a bill designed to connect the remedial institutions directly with the State University, and thus economize the facility of research and encourage the broadest view of the subject.

The standard of custody in the several States varies in a most remarkable degree. The material construction of the building, the proximity or remoteness from the critical surveillance of large centers of population, the accidents of legislation and the personal equation of practical politics and party patronage make all the difference between laudable efficiency and damnable spoilation in the conduct of asylums.

Waves of reform have passed from State to State, from institution to institution, and the average efficiency of the custodial asylum has risen from decade to decade. Further improvement in this direction seems almost impossible, and at the present time the conscious effort of all State commissions is to secure the passage of the institutions from *custody* to *cure*—from the protection of society from the insane to the protection of the members of society from the catastrophe of insanity. The custodial institutions harbor-

ing tuberculosis, pellagra and slow starvation began purging themselves of these institutional diseases by the construction of special tuberculosis hospitals. The second aroused them to investigating the sources of the malady and then promising, by changing their appellations, to become remedial of the conditions of which all insanity is but a symptom.

This change has come about from a pressure from without and an impulse from within. There was never a time when the medical waters were more troubled than at present. Pure science never advanced more rapidly than now. The whole world, however, seems to be possessed with a frenzy for the psychic. The old religions are giving place to deeper mysticism. Strange cults with most unintelligible speculative ontologic theologies are engaged in curing colds and in erecting temples and cathedrals. Any sort of pseudo-philosophy can secure a following by the presentation of the commonest incidents of mind in an obscure or foreign persiflage. Medicine in a measure follows the fashion. The new psychiatry explains all the ills of man from delirium tremens to appendicitis on a psychogenetic basis. Small wonder then that the keepers of the insane should be taken with this fad. The names of all the insanities and the names of the journals of lunacy have undergone a change. Old words go with the old philosophy and new words come with the new ontology.

The common people and the medical profession know little of what is going on behind the doors of the insane asylums. The alienists are a class by them-

selves. They are composed at present of a recessive group of old-fashioned politicians with a smattering of medicine and a dominant group of new-fashioned business experts with a smattering of real science. There are a few unattached individuals among them who are real scientists with a smattering of practical politics.

Upon the keepers of the insane have been forced by the trend of time the change from custodial to remedial pretensions. In New York, a pathological institute was added to the system of asylums as a central training school for the physicians and medical officers of the State. The school has quarters in the city of New York with two wards attached for study and demonstration. Psychogenesis has been the principal topic of research, but a considerable amount of histological pathology has been undertaken.

The hospital service in the other institutions in New York has passed from the care of the tuberculous to the treatment of the acutely insane, but a reading of the Twenty-First Annual Report of the State Commission in Lunacy does not lead one to think that any effort is being made to seek the sources of insanity in any *physical* condition, nor is any accent placed upon such therapeutic measures as have been empirically found of some avail.

The former head of the Pathological (Psychiatric) Institute, speaking of his guidance of its activities, says (*l.c.*, p. 102):

"It has taken much courage and unswerving determination to pass by many of the fads of the day,

to appear unprogressive in matters which attracted the naive and the clamorers, to profess ignorance and a passive attitude concerning certain matters which were heralded as simple and final explanations, where we were more concerned to get a broader rather than a narrower grip on things. I cannot see that much has been missed. The result is that we have but few outfits for work bought at great expense merely to be stored away after the wave of interest and disappointment had passed; and also little of the kind of notoriety which looms bright in Sunday magazines, excites false hopes, brings a questionable kind of personal glory, and in very rare instances a choice morsel to those who like to adorn their negative life with an 'I told you so.'"

When we take these words in connection with the contents of the *Psychiatric Bulletin* and his liberal and frank statement (Proceedings of the American Medico-Psychological Association, sixty-fourth annual meeting, 1908, p. 130) of his conviction that the insanities are due to "peculiar mental tangles" rather than to "coarsely appreciable and demonstrable brain lesions or poisoning," not much can be expected from the New York State Psychiatric Institute in the way of research into the *physical* basis of insanity.

If we come nearer home we find that Michigan has a Psychopathic Institute most fortuitously situated next door to the hospital of the State University at Ann Arbor. The institution occupies a very decent building, commanding a beautiful prospect. There are three wards and an administration department. The institution has no vital relation with the university although on the campus. It has a separate budget be-

fore the legislature. It is not vitally connected with the asylums either. There is no laboratory work done in this institute, and patients receive no therapeutic or dietetic consideration or treatment. They are provided with food if they will eat, and expansive histories are taken when they can be elicited. The director is given up to the psychogenetic origin of lunacy. The psychoanalysis is carried out. The nurses are untrained and of uncertain efficiency.

It has not been possible for us to find the amounts of money available for the Institutes in New York or Michigan, and an actuary has not been consulted. The amounts, however, appear to have been scanty.

The proximity of the Michigan Institute to the University is ideal, but it should be an integral part of that foundation. The departments of chemistry, physiology and biochemistry of the University of Michigan are so manned that they could co-operate with the Institute in studying the problems of the insane. The association of all these faculties in prosecuting researches in metabolism, chemiotaxis, hemolysis, immunization, as well as the simpler problems of nutrition and excretion, would naturally and inevitably take the activities of the institute out of the mystical oneiromancy of the transcendental psychiatrist. (See articles on dreams in current psychiatric periodicals!)

There is no life in the present relations between the Institute and the custodial asylums on the one hand, and the Institute and the University on the other. The literature shows no buds of promising fruit from these irrational and incongruous alliances.

The State of Illinois is one of the most generous in its treatment of the insane and other dependents and defectives. Her appropriations are munificent and the management of her institutions are not beset by those harrowing restrictions which are so heavy on the already almost breaking endurance of the friends of the insane.

More than three years ago (1907) a liberal appropriation (\$25,000) was secured for the establishment of a State laboratory for the study of the condition of the insane, with the promise from its sponsors that it would help solve the problems of the insanities, to the end that some of the insanities would be prevented and some of them cured; to the end that instruction could be given in the laboratory to the internes and physicians, who would thereby be better able to care for the inmates and cure a larger number; to the end that citizens would thus be returned to useful positions in the world, and the State be saved further custody, care and expense.

It was a rational idea, and was hailed alike by physicians, press and people as a logical, promising and worthy undertaking. The result after three years is not inspiring.

The State Psychopathic Institute is located in the grounds of the Kankakee State Hospital. It is a creditable building, equipped with every instrument and convenience that one could desire, and furnished with a working library. The space is sufficient and the equipment adequate for a staff of six or eight laboratory men. The annual appropriation, \$4,000 is not

enough, after paying the director's salary, to supply the needs of a single investigator. Everything, however, is in apple-pie order. The director of the Institute is a capable man, with a training which recommends him to confidence.

But accoutrement, ammunition, armament and a general does not make an army; no more do equipment and a director make a laboratory. The problems of insanity require an army of laboratory workers to undertake their solution, and the citizens of the State of Illinois are anxious to have the work vigorously pursued, and are willing to pay the bills. The citizens of the State and the medical profession of the world are entitled to know how rationally and how vigorously the work is undertaken, and what answers nature makes to the questions which the ingenuity of laboratory men propose.

What is our disappointment to find that our Psychopathic Institute is without a single laboratory worker except the director; that the problems for which the laboratory was instituted are unstated, and that no effort is made to solve any of them; that the director himself does not seem to us to act as if he believed in the possibility of a tangible physical cause for the insanities, but as if he conceived them to be due to "a twisted idea."

In the *Institution Quarterly* (Springfield, January, 1911, page 6) we learn that the director of the Psychopathic Institute asked for an appropriation of \$16,000 a year for the coming two years—\$12,500 for salaries and \$3,500 for books, instruments, chemicals and mis-

cellaneous expenses. In the most naive manner the fiscal supervisor, with the cocksure self-reliance of a business man, allows only \$11,800, as follows: "Salary of director \$3,500, clinical assistant \$1,800, clinical pathologist \$1,800, two stenographers \$1,200, chemist \$1,200 and janitor \$300. For books, instruments, chemicals and other expenses, \$2,000 per annum will be ample."

It will be noticed that only one person is expected to work in this laboratory; the rest are clinical, namely, the *clinical* assistant, the *clinical* pathologist and two stenographers. Possibly the janitor and the chemist together can do some laboratory work.

But let us see how the Board of Administration interprets the fundamental law establishing not only the Psychopathic Institute but the Board itself (Code of Charities, approved June 15, 1909), in the preamble of which are these pregnant words, outlining the objects of the act: "*To promote the study of the causes of dependency and delinquency, and mental, moral and physical defects, with a view to cure and ultimate prevention,*" and further that this act "*shall be liberally construed to these ends.*" In general orders No. 6 of the Board of Administration, the work of the Psychopathic Institute is so fully outlined that it leaves no doubt in the mind of any considerate reader that so far as *a study of the physical causes of the insanities* goes there is "nothing doing" at Kankakee. One paragraph out of these pages is enough to quote here: "Its chief function shall be the teaching of psychiatry and of the most advanced conceptions in neurology, in

so far as neurology relates to psychiatry, and *such research work* as may aid in the establishment of a more modern and effective system of caring for the insane, feeble-minded and epileptic."

In New York the Pathological Institute has become a "Psychiatric Institute," in Michigan the Psychopathic Hospital has never been in any sense a hospital or pathologic institute and has absolutely no connection with the university and its laboratories, in the grounds of which it is located; and in Illinois the Psychopathic Institute is loaded down with routine and educational work of the most primitive description, and is wholly given up to psycho-analysis to the complete neglect of original research of a chemical, hematological and serological character, or to metabolic studies of such a nature as every metropolitan hospital now maintains for patients whose conditions are already solved problems.

So it seems that the omnipotent if not omniscient Board of Administration is keeping up a paper psychopathic institute on \$4,000 a year, and proposes to keep it up on an appropriation of \$11,000 per annum, in spite of their salary and oath of office, in which oath they swore to construe the "Code of Charities" liberally.

If the State of Illinois had 15,000 of its average citizens, old and young, rich and poor, incarcerated in however gentle a durānce by an inexorable enemy, would this great State send out an army of deliverance consisting of a single general and equipment for less than ten men—but no men at all? Would the State

send out a general who they had reason to believe doubted that these 15,000 citizens were forcibly restrained and kept in involuntary confinement—a general who, however expert in the arts of war, had no enthusiasm for the cause at issue?

Here we have the director for three years of a psychopathic institute, equipped with all the instruments to combat ignorance, with rabbits, guinea-pigs and monkeys in abundance, and not a worker in the laboratory; more than that, without any potent conviction of the physical cause of mental aberration. The rabbits and guinea-pigs multiply, new cases of insanity come into the hospital every day, the janitors keep the equipment clean and presentable, and the director of the State Psychopathic Institute pursues the study of insanity by inquisitorial methods that need no instruments except the pencil of the stenographer and no equipment except his stop watch and the table and chairs of a parlor.

The director of the Psychopathic Laboratory, moreover, has had the care and duties of a ward, and also the wholly extraneous labor of a medical schoolmaster. These duties have been undertaken in addition to time-consuming duties of the ancillary commission for the protection of the corn crop, namely, the Pellagra Commission.

These things are not written as a complaint, but as a petition. Our contention is that the insanities are etiologically physical ailments, and that their understanding is to be attained by physical laboratory methods based on rational theories. With us, apparently,

was the legislature of the State, that enacted the Code of Charities, and the promoters of this first State laboratory for the study of the insanities. If it had been the Freud theory and the Jung inquisition that the legislature contemplated in the acts of 1907 and 1909, there would have been no need of apparatus. The treatment rooms of any Christian Science temple are ample for this method. If workers in the laboratory are not furnished by the Board of Administration, the director is helpless. He is in the position of a general without an army.

There is a disease among cattle which we may hear about if something is not soon done to stop its spread in the Mississippi Valley. It is known among European veterinarians as "epidemic contagious abortion." Bacteriologists have recognized and identified it in various parts of Illinois. Now let us venture a prophecy! When the stockmen and farmers are unable to conceal the presence of this disease any longer, they will appeal to the legislature and get without opposition an appropriation of \$50,000 or more a year for the "Institute of Epidemic Contagious Abortion of Cattle." The Dairymen's Association (Act of June 11, 1909) will not fail to vigorously look for the means of preventing this disease and they will not resort to any stripped poplar rods or other sacerdotal device (Genesis 30: 32-43) or fail to liberally interpret the acts of the legislature.

In Chicago, and at Urbana and Evanston, as well as elsewhere in the State, there is a round score of young men trained in many of the rational methods of the

laboratory and having the ingenuity and the scientific prescience which can ask answerable questions of nature, and get indubitable and intelligible replies. These men are ready to serve an enthusiastic and unswerving director in the pursuit of so worthy an object as that for which this laboratory was established. The salary which the State pays internes and physicians is adequate, the motive obvious and laudable and the chances of progress are hope-inspiring.

While considering the sort of workers likely to make good in a psychopathic laboratory, the last number of the *Edinburgh Review* (January, 1911) opened to an article on heredity beginning with these oracular words: "It is an interesting question as to how far the solution of a vexed problem is facilitated by the preliminary study of previous attempts to solve it. Most people if asked off-hand would regard it as an axiom that the history of opinion on the subject they are studying must be of some value in advancing that study. Yet in many problems of science * * * * we are inclined to believe that correct solutions are more likely to be achieved by a mind coming fresh from the prevailing atmosphere of modern times than by one steeped in the heterogeneous mixture of truth and absurdity which emanated from a less scientific era." These words express our own notion of the equipment of the laboratory men who must be looked to by us to dispel our ignorance of the origin of the insanities. The State has furnished the equipment, the universities of the State have educated the young men, the power is in the board of administration, the

medical profession of the State expects results, the citizens of the State demand action and efficiency, and all this time in a durance worse than that of the victims of the Cherry coal mine, 15,000 helpless wait.

Of course we cannot expect each of the forty sovereign States to have an Ehrlich or a Flexner as a director, but certainly there are latent Noveys in every one of the States and potential Welches in every university. The problems are so fundamental and our ignorance is so dense relative to all the sources of insanity that the greatest liberty must be given the investigators to pursue what might be considered *a priori* unreasonable tangents. The best director is the one with the scientific imagination, the immovable purpose and the perception which sees all the possibilities in the clamorous, the enthusiast, the sturdy and the naive—he is the thorough and patient investigator whose motive and method inspires his associates to indefatigable labor.

The service of the State institutions of charity has a bad reputation among medical and scientific men. The State universities are exempt from such imputations in varying degrees. The University of Michigan has long been honored by staunch members of its faculty and by the unsullied devotions of a long line of trustees who have given their best years to its undivided interests.

The radical departure of Illinois in the Code of Charities of 1909, placing the management of its institutions under a Board of Administration, must be

looked upon by all the friends of the insane and by political scientists with anxious expectation. The Act distinctly states in its preamble that it shall be *interpreted liberally looking toward cure and prevention*. The Board of Administration may take the narrow businesslike statutory view of their duties or they may take the broad and liberal view that has always guided the trustees of the University of Michigan. They may wait for statutory mandates for all their activities or they may take the Code of Charities at its word and pursue the study of the causes, they may seek a method of prevention and cure of the maladies of their wards with all the resources which a generous and wealthy State has heretofore and will hereafter appropriate at the request of an efficient, an honest and a vigorous administration. The danger of a fitful and rapidly changing administration has past. Whatever befalls can now be placed at the door of the Board. If they save at the spigot while they spill at the bung, it will be easy to show who is responsible. In the management of the State charities as nowhere else, an ounce of prevention is worth a pound of cure. It is in research and education and not in economy in purchasing or in efficiency of custody that we must expect the most praiseworthy action of the Board.

It has always been our contention that the Psychologic Institute should report to and be an integral part of the University, both in Michigan and Illinois. The advantages of a close association between the chemical, biochemical, bacteriological, botanical, dairy, entomological, zoological, veterinary, engineering and legal

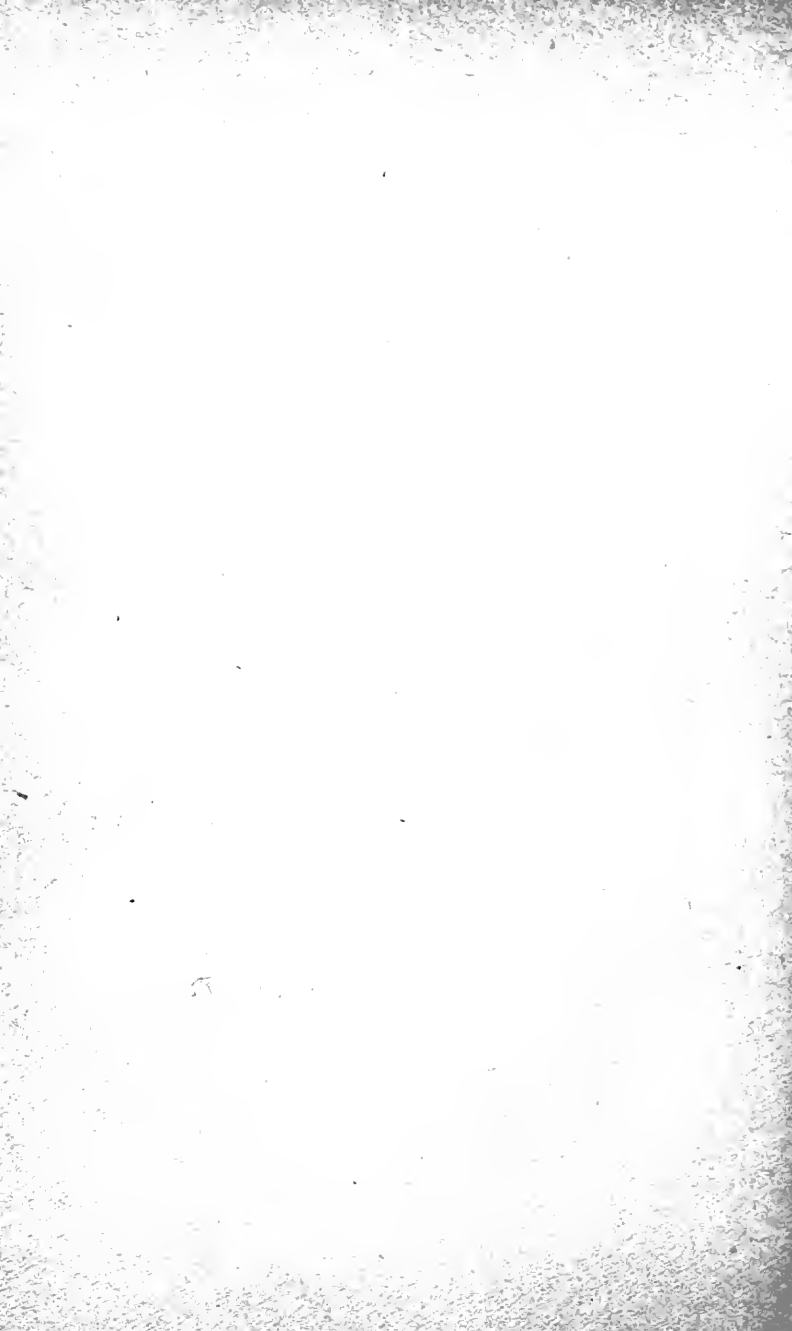
faculties cannot be overestimated when approaching the dark problems of insanity and delinquency.

We are certainly warranted in the statement that there is no likelihood of any vigorous systematic investigation into the *physical* causes of insanity at the Institutes of New York, Michigan or Illinois. Somewhere, sometime, this work will be carried to completion.

With the establishment of similar institutes in the various States we may hope for happy conditions and a favorable outcome in some of them. In a problem of such obscurity too many independent methods of research can hardly be possible. Every Institute would have a personality and individuality of its own.

It was in South Carolina that pellagra was first recognized, though there is every reason to believe it had existed elsewhere, even in Illinois, for thirty years. It is possible that some local condition or combination of conditions will furnish the key that will unlock the door which has kept dark the etiology of the diseases of which the insanities are symptomatic.

The smuggest parsimony would dictate that for every hundred dollars appropriated by the State for custody of the insane one dollar at least be expended directly in research into the causes of insanity.



BERIBERI AND DEMENTIA PRECOX OR ADOLESCENT INSANITY.

HOLDING, as we do, that adolescent insanity is a physical ailment, of which either exceptionally or uniformly mental deterioration or dementia is a compelling symptom, we naturally seek analogies in other diseases. In preceding pages certain conditions have been considered which seem to us to strengthen our position. We naturally seek further analogies in unexplained diseases that affect the nervous system, and have selected beriberi from a long list ranging all the way from gout and pernicious anemia to the obscure disease known as milk-sickness.

There is a remarkable similarity in the attitude which the majority of clinicians held toward tuberculosis in the sixties and seventies of the past century and the attitude of the alienists of to-day toward dementia precox, or adolescent insanity. One can parallel the arguments of these widely separated classes for an intangible, inscrutable, inexorable source of each disease. The clinical deductions and the conflicting experimental investigations of tuberculosis as brought together by Max Schiller (1868) had little influence on entrenched opinion until Robert Koch's irrefutable biologic investigation swept away the last vestige of medieval mysticism relative to tuberculosis. In regard to the origin of insanity, or of the insanities, the alienists are desperately fixed upon psychogenesis.

At a recent meeting of the Chicago Neurological

Society, at which a clear-cut chemical investigation of the brain in dementia precox was presented, the amen corner was politely attentive but unanimously, though diplomatically, pronounced for the psychogenetic origin of dementia precox, and naturally for the psychogenetic origin of the chemical pathology demonstrated by the investigator.

The literature of yellow fever is also analogous to the present literature of dementia precox in the prominence given the hereditary, the psychic and the theoric.

The literature of the plague furnishes innumerable parallels to the current literature of psychiatry.

The literature of Asiatic cholera as late as 1866, and in sane America, put forth the psychic as a powerful factor in the onset of the disease.

Beriberi or, as the Japanese call it, kakke is a disease of unknown origin and of world-wide distribution throughout the temperate zones and the tropics. It seems to have its geographic centre of intensity about the China Sea, but it is confined by no continent, limited by no ethnology and excluded by no civilization. While it seems to be endemic or to arise spontaneously in the prisons, asylums and capitalistic labor pens of the world, it attacks the best fed armies and navies, and ravages the wealthiest and most cultured classes in Japan. It is a disease which has been known from the earliest antiquity, but has received until recently only scant attention from the medical profession of Europe and America. The Japanese tell us that kakke was well described by the Chinese two hundred years before Christ, and Strabo recounts an epidemic in the

Roman army invading Arabia 24 B. C. The Japanese navy had for years been paralyzed by the disease until Surgeon Takaki introduced a strictly scientific daily ration. From the Japanese army during the war with Russia more than 50,000 were sent home with kakke during the first year, and many died of the acute disease at the front. Commencing with the second month of activities, March, 1905, when the first ten were sent back to Japan with the chronic disease, the following were returned each month during the calendar year: 65; 108; 253; 1,602; 7,960; 13,505; 10,811; 9,344; and 6,628.

The disease is endemic in the Philippines and in the Dutch, English and French possessions in the Orient. It is endemic in Africa from end to end where its afebrile course is in marked contrast to the fulminating diseases of that disease-ridden continent.

Beriberi has often been noticed in the Western hemisphere—in South America, in Panama, in the Caribbean Islands and Mexico and among the fishermen on the banks of Newfoundland. Putnam, in 1890, reported cases in New England; seventy-one cases were observed in the insane at Tuscaloosa, Ala., in 1896, and a large number in the Arkansas Insane Hospital at Little Rock the same year. It has been endemic in Louisiana for twenty years at least, and was reported in 1910 by Jervey and Butler in an epidemic among the convicts at Ten-Mile Hill, Charleston County, S. C. In two weeks in the month of March 150 out of 300 convicts came down with the disease, and the physician of the old prison from which they came recalled many

previous epidemics of the same condition which had passed unnamed during the preceding twenty years. In the Texas Lunatic Asylum at Austin there was an epidemic in 1907 with 200 chronic cases and twenty deaths among the acute cases. There is no doubt that many other sporadic cases throughout the United States are overlooked because the disease is not studied by our profession.

Beriberi is an acute or chronic infectious toxemia, characterized clinically by disturbances of circulation, of motion and of sensation, and associated anatomically with hypertrophy and degeneration of the heart, of the peripheral nerves and of the voluntary muscles. (Wright). It has been called endemic polyneuritis (Baelz) and endemic multiple neuritis (Scheube).

When the United States soldiers in the Philippines came down with beriberi the Bureau of Science began the study of the disease. Herzog produced his two careful studies of the disease which offered a clear picture of the above situation (*Philippine Journal of Science*, Vol. I, No. 7, September, 1906, pp. 709-764). He investigated the claim of the Okato-Kokubo coccus in the hospitals of Japan and took cultures back to the Philippines for further study. He set aside this claim on every ground and began the study anew. His material was carefully observed and cannot fail to be of inestimable value to subsequent systematic students.

During the succeeding six years much has been added to the history of kakka, of which a brief outline may be interesting.

Inagaki, Horiuchi, Hakase and Nemori have been

led from a study of a toxic colloid in the milk of mothers suffering of kakke and the milk of other mothers who came down with kakke as soon as the milk dried up, to a study of the fermentation of rice and kaka diastase, in a search for the origin of the disease. They are quite agreed that the disease is due to a yeast which is found both in boiled rice and in kaka diastase. The reading of these articles is very convincing of the ability, scientific integrity and absolute frankness of the investigators, but it furnishes no adequate clinical support.

The clinical students of kakke have long known that sucklings of mothers who have chronic beriberi do not always, though they do frequently, suffer of the disease. Now another clinical observation is relevant, that many nursing mothers whose previous history only remotely suggests beriberi come down with a severe form of the disease as soon as their breasts dry up. Again, many perfectly healthy mothers lose infants from an uncertain disease and when the milk dries up the mothers come down with beriberi and it becomes evident that the child died of the acute disease.

The Japanese authors referred to began in the light of these clinical observations a careful study of mothers' milk. In the milk of beriberi mothers they found a toxic substance which paralyzed the frog's heart in a characteristic manner. This substance was also found in the feces of kakke patients and in rice fermented with a specific yeast. It is their conclusion that rice fermentation with this yeast goes on in the intestinal tract and generates the beriberi toxin which is the true cause of the disease.

While this work was going on in Japan, Frasier and Stanton made an experiment with chickens, which seems to indicate that polished rice is the basis of the disease. They fed groups of twelve chickens on polished rice and other groups of twelve chickens on unpolished rice. At the end of sixty days kakke developed among the former groups, the latter remaining well. They then took some of these groups for a reversal of the food. Again, at the end of sixty days, the chickens that had been well during the first period became sick and the sick chickens got well. They had an opportunity to try out the same food experiments on several gangs of healthy railway laborers in Siam. They fed, besides other food, polished rice to one gang and unpolished rice to another gang. In two months those fed on polished rice had beriberi as usual, those fed on unpolished rice were all free of the disease. Now the food conditions were reversed, and in due time the sick became well and the well sick. Fink tried the rice, polished and unpolished, on parrots with identical results and reversing the food the sick got well and the well sick. Aron made a study of the constituents of the polished and unpolished rice and concluded that the phosphorus-bearing husk might be necessary to health. Experiments in using polished rice and adding a proportionate quantity of husks seem to favor Aron's contention.

In the rules of the Administration, civil, military and naval, the use of polished rice is prohibited in the Philippines. (Heiser, *Journal A. M. A.*, Vol. 57, April 29, 1911, p. 1238). The results have warranted the

rule. There are many places, however, where no rice is used and yet beriberi is endemic.

Tanaka reviews the whole subject and holds to the theory that kakke is due to a micro-organism growing in the intestine on a rice diet. This would not be inconsistent with the yeast intoxication theory.

Heighet (Bankok), in the twelfth annual report of the Siam health office (*Journal Tropical Medicine*, Vol. 13, p. 323), reports a most terrible outbreak of kakke. Out of 400 only 227 remained at the end of two weeks when parboiled rice was used with remarkable benefit.

There are many respects in which beriberi resembles dementia precox: (1) It attacks the young, less often infants and old adults. (2) It is manifest in an acute and rapidly fatal and a chronic and a recurrent form. (3) It is generally, though not always, an afebrile condition and even in the most tropical regions kills rapidly with no disturbance of temperature (Plehn). (4) It generally begins with malaise and abdominal distress. This is rarely pain, but a most distressing discomfort. (5) There is an incubation or prodromal period of ten to fifteen days (Wright). (6) There is early disturbances of sensation of all five senses. (7) The heart's action is accelerated and the blood-pressure falls below normal. This continues over considerable periods in both diseases. (8) In nearly all cases of both diseases there is dilation of the heart, shown by the increased cardiac dullness, displacement of the apex to the left, and in the worst cases distinct murmurs. (9) The urine in both diseases is diminished at first and contains indican. The urine increases

with improvement or recovery. Albumin is rarely present in either disease and when it is concomitant accidents are present to account for it. (10) In both diseases there is at times an edematous condition of the whole body or of certain circumscribed regions. On the face and extremities this edema is most conspicuous. (11) There is in both diseases a lilac tinted cyanosis which shows itself in localities such as the fingers and toes, certain areas on the cheeks and lips. (12) Improvement follows when hygienic changes are made early in the disease. After it has continued a longer time, relative recovery alone can be expected. (13) Both diseases encourage the onset of tuberculosis, dysentery and in some localities malaria. (14) The result in both diseases is a certain inco-ordination of motion, which is termed by the alienists mannerism. (15) The death rate in the chronic disease, both of beriberi and dementia precox, is small, 2 to 5 per cent.

By these analogies we would suggest that the proper attitude toward beriberi, kala-azar, pellagra and the milk-sickness of our prairies is the proper attitude toward adolescent insanity. Dementia precox is no dream, it is no inscrutable dispensation of providence, it is no engulfing habit. It is a toxemia of tangible, material origin, which a suitable application of the inexhaustible cunning of the human mind will bring to light and subjugation.

PELLAGRA AND ADOLESCENT INSANITY.

I.

NO DISEASE has so aroused the imagination and fear of the country people of the Mississippi Valley, whatever indifference the medical profession may manifest, as pellagra has recently done; and no yellow journal tale of institutional atrocities has caused such anguish and alarm to the friends of the insane as the appearance of pellagra in the generously supported asylums of custody of the Central United States.

This disease is relatively new to medicine or, if not new, it was long confounded with the many other allied conditions of which men have suffered so patiently. Unlike beriberi, it is a disease of the country rather than of the city. It is a seasonable disease attaining its height in midsummer or early autumn. Its geographic center of intensity is not about any sea or ocean, but in the great river basins, especially in the Valley of the Po and of the Nile. It is a disease of many and bizarre symptoms and no brief epitome of its manifold manifestations can here be given, but they are well known and are indubitably vocative of a toxoinfectious process.

The older physicians of the country who now, for the first time, see named cases of pellagra collected together in the asylums and poorhouses, recall from the memory of the early years of their practice similar cases which they were never able to place in any nosologic category. For example, my butler, who is an intelli-

gent colored man from Georgetown, Mo., refused when he first came to me in the eighties, to eat any corn bread because, he said, it brought on a corn scrofula. He described to me at length the condition of a neighbor's boy, Tom Paulin, the son of a widow, Sarah Paulin, who had this terrible disease. It came on every summer from 1882 to 1887, and made a raw collar about his neck and a sort of dickey on his chest and a glove-like bealing on his forearms and a stocking-like blistering on his legs. An old doctor named William Brocksmitth, who I find practiced in Sedalia, Mo., in 1886, and was put down in Polk's Directory as from Berlin, Prussia, '65, told the Paulin folks that this disease was due to eating Indian corn. My attempts to find Tom Paulin have not been successful, but considerable information which medical men of Sedalia have furnished, substantiates the presumption that in 1882 Tom Paulin had pellagra and that Dr. Brocksmitth recognized it.

The recent discovery of pellagra in the United States is a symptom of one of two things. Either professional accuracy and integrity have greatly increased, or an epidemic appearance of a previously sporadic disease has occurred. We know now that pellagra is not limited by any state or by the economic conditions of life. Like beriberi, pellagra has been looked upon as a dietetic disease. It probably stands in no closer relation to diet than kakke, milk sickness, infantilism (of Herter) and diabetes.

Pellagra, like beriberi, has a marked effect upon the nervous system. Beriberi shows its effect upon the

peripheral nerves and the motor nerves of respiration and circulation, while pellagra manifests itself in cerebation. In Italy about 10 per cent. of the pellagrins are insane, but in the United States the proportion of insane pellagrins is certainly much higher.

Assuming that pellagra and dementia precox are toxi-infectious diseases, we have found many analogies between them. (1) Both diseases attack the young in about equal proportions, regardless of sex. (2) There is an acute fatal and a chronic relapsing form of both diseases. (3) While both diseases are multifarious in their manifestations, they are likely to assume at any time unmistakable pathognomonic features. (4) Both diseases are intermittent and seasonable, but pellagra markedly seasonable. (5) The symptomatologies of the two diseases have been so differently interpreted that no two authors agree in the types or systems in which they elect to classify cases. (6) Both diseases are prone to have a long prodromal period, though either of them may seem to come on suddenly. (7) They are alike in the early gastro-intestinal symptoms, the malaise, the disturbance of sensation, the affection of the skin, especially where exposed to the light—mild in dementia precox on the scalp, face and neck, conspicuous in pellagra—and in the loss of weight and strength. (8) The mental symptoms are so similar that most of the patients entering the institutions for the insane in Illinois were diagnosed as dementia precox. (9) In both diseases the impressions received by all, or by some of the five senses, are markedly distorted. (10) There is a remarkable perversion of the salivary secre-

tions in both diseases and we believe of other gastrointestinal secretions, and as a result a new plankton naturally appears in the mouth, oftentimes resulting in a rapid destruction of the teeth. (11) Both diseases are attended by significant changes in the blood. There is always a leucocytosis and often a polycythemia (Bullig). (12) In both diseases there is a rarifying osteitis verging toward osteomalacia or fragilis ossium.

If one reads Chapter V, pp. 147-181 of Lavender and Babcock's edition of Marie's Pellagra (Columbia, S.C., 1910), he can see many other parallels between these two diseases, but, for our purposes, the preceding recital is adequate.

From very early times pellagra has been attributed to polenta made from spoiled corn, just as kakke has been attributed to a rice diet. No consideration of the etiology of pellagra nor of the etiology of adolescent insanity can neglect the dietetic metabolism. The Illinois Commission on Pellagra has not yet published its report, but rumor has it that it has not incriminated the corn crop of the State. There is every reason to believe that pellagra is encouraged by an ill-balanced diet and that corn often furnishes the necessary disturbance of dietetic equilibrium.

The toxi-infectious disease known as pellagra does produce insanity, which insanity the alienists call by one or another of their clinical names. Among these appellations is dementia precox. At Dunning, Peoria and at Kankakee a large proportion of the pellagrins were set down previous to the recognition of the somatic disease as cases of dementia precox. To us this

suggests that there are other toxi-infectious diseases besides beriberi, milk sickness and pellagra which cause some or all of the other cases of dementia precox now looked upon as of psycho-genetic origin, and that there is a likelihood, moreover, of discovering the identity of these diseases and some methods as successful as in the case of beriberi of preventing and curing them.

II.

The healthy influence of a rational attitude toward the inmates of the institutions for the insane which the appearance of pellagra brought about, is manifest in a thorough investigation of the dietetic values of the daily ration and in the study of the physical conditions of the sufferers which has aroused some therapeutic interest. To take a single instance the reports made during the past three years of the value of the transfusion of blood is significant. The value of the transfusion in hemophilia neonatorum, in acute anemia and in certain toxic conditions, is demonstrated to a practical finish. The results of serum therapy in various infectious diseases is an every-day argument. The general belief in the remarkable efficacy of changes in the blood has led to the use of transfusion in moribund cases of pellagra.

In medicine, as well as in other departments of thought, there are waves of interest which come over the public mind from a combination of inexplicable causes.

The mind of the seventeenth century was alive to all the possibilities of overcoming the hostility of nature. Thomas Shadwell's Sir Nicholas Gimcrack in "The

Virtuoso," was given up to experimentation. He had certain sympathetic tubes in his laboratory which always resonated to sounds produced in either one of them regardless of miles of separation. It was possible by speaking in one of these tubes in London to convey the voice without defect to the other tube in Cromwell or Newgate. Sir Nicholas asserts that he was not quite perfect in the science of aviation, but that he could fly as well as a bustard. His achievement in the transfusion of blood, however, was a sort of climax of his experimentation and is of particular interest to us in this connection. On page 28 of "The Virtuoso," London, 1676, he is made to say:

Sir Nic.—That's frequent. Besides, tho', I confess I did not invent it. I have performed admirable effects by transfusion of blood, to-wit, by putting the blood of one animal into another. * * * Why, I made, sir, both the animals to be emittent and recipient at the same time, after I had made ligatures as hard as I could, for fear of strangling the animals, to render the jugular veins turgid I open'd the carotid arteries and jugular veins of both at one time, and so caused them to change blood with one another.

Sir For.—Indeed, that which ensu'd upon the operation was miraculous, for the *mangy spaniel* became sound and the *sound bull dog* mangy.

Sir Nic.—Not only so, gentlemen, but the *spaniel* became a *bull dog* and the *bull dog* a *spaniel*.

A little farther along the inimitable Shadwell makes his Sir Nicholas Gimcrack enter the field of the alienist and taking a madman he selects the tamest of all animals, the sheep, and transfuses sixty-four ounces *Haver du pois* weight of blood according to his method

from the one to the other, with the remarkable result that the maniac becomes ovine not to say sheepish, in his disposition and conduct. This operation produced no unfavorable results upon the maniac except the growth of a few adventitious tufts of wool, but it proved fatal to the devoted sheep.

We were interested to see what could have aroused in the fertile brain of Shadwell such a conception and were delighted to find that there were numerous instances of similar experiments recorded in the literature of the time. To be particular, there was a small duodecimo emitted "da Emilio Marie Manslessei," Bologna, 1668, with the following prophetic and significant title:

Relazione dell' esperienze fatte in Inghilterre, Francia ed Italia intorno alla celebre e famosa transfusione del sangue per tutto maggio 1668. In cui oltre all' ap-pugnationi, a difesa, si vede la sanita restituita ad alcuni inferni, e particolarmente a un pazzo. La maniera di facilmente praticarla negli huomini, e la minuta descrizione; di essa, con nuova esperienza in un cane vecchio, e sordo restituito alla forza, e udito.

It is possible that Shadwell had seen this and other similar theses.

But to return to the real. The trend of modern hematology leads us to hope for a therapeusis which but a few years ago would have been looked upon as Quixotic.

Through the kindness of Drs. Lewis Pollock and F. B. Clark I am permitted to give here an outline of the results of transfusion of eleven moribund cases

of pellagrous insanity at Dunning. This work was interrupted by the rampages of a political bull in a china shop. These pioneer adventures will be reported in full by the investigators, and only with such a full report can their value be assessed; they are about as successful as the appendectomies of 1886-7.

1. Minnie M., thirty-five, pellagra sine pellagra, melancholia, diarrhea, comatose, moribund, transfused April 27, 1910. Blood of recovered pellagrin. Died thirty hours later.

2. Mary O'C., twenty-eight, pellagra, dementia precox, diarrhea, emaciation, great weakness, transfused July 13, 1910; recovery, mental condition unchanged.

3. Nellie S., pellagra, dementia precox, diarrhea, emaciation, transfused August 8, 1910; recovery, mental betterment.

4. Louise G., thirty-five, pellagra, dementia precox, dysentery, stupor, bed sores. Transfused August 26, 1910. Died thirty-five hours after operation.

5. Rosa S., fifty, pellagra, stupor, dysentery, moribund. Transfused September 20, 1910. Died fifteen days after transfusion.

6. Sarah R., thirty-seven, pellagra, dementia precox, dysentery. Transfused January 5, 1910. Recovery.

7. Thomas O'H., thirty-four, pellagra, paresis, dysentery, polycythemia, afebrile. Transfused October 1, 1910. Died seven days later.

8. Anna L., twenty-seven, pellagra, dementia precox, febrile, leucocytosis, nephritis, exhaustion, dysentery. Transfusion in a remission of septic symptoms. Death twelve hours later. Shiga bacillus dysentery.

9. Justina K., forty-eight, pellagra, dementia precox, afebrile, asthenic, edematous, polycythemia. Transfusion August 18, 1910. Rapid recovery.

10. Lena S., pellagra, delusions, stomatitis, emacia-

tion, diarrhea, asthenia, temperature 101°. Transfusion October 13, 1910. Rapid recovery. Died ten days later of acute pneumonia.

On the same day the emittent died of pneumonia also, and one may very well consider the possibility of her having had the pneumococci in her blood which she gave out to the recipient for the cure of the pellagra, but to the detriment of both, as they came down and died of pneumonia upon the same day. This would indicate the desirability of making a blood culture from the emittent.

11. David W., thirty-five, pellagra, depression, emaciation, stomatitis, salivation, asthenia, red 3,200,000, whites 8,000. Transfusion August 3, 1910. Died six days later.

Every one of these patients was in such a condition that death was impending. After the transfusion improvement followed in five cases, and all but one of them recovered. This one (10), Lena S., died of a pneumococcus pneumoniae on the same day that the donor died of the same condition.

There are several things to be considered in this adventurous procedure. The young men who worked together for its accomplishment used the remedy only when all possible hope of improvement by expectant or other methods had been abandoned by every one concerned and the patients themselves were *in extremis*. They undertook a surgical procedure requiring the greatest delicacy and a technical experience which nothing but the vivisection room could give. They were working under the stress of political criticism and newspaper publicity, and without the support

of academic and professional sentiment. The results are gratifying and promising, but they probably disclose possibilities of error and danger which can be eliminated only by the most intimate team work between the physiological laboratory, the hemolytic laboratory and the surgical operating room.

Samson's recent surmise of the relation between the *simulium* and pellagra may or may not be sustained, but it is certain that a considerable portion of the insane in the Mississippi valley will be subjected to rational observation and removed from the etiologic category of the psychogenetically insane.

If the conservatism, inactivity and self-complacency of the keepers of the insane can be disturbed by the advent of pellagra, it may be looked back to as a blessing in disguise, and although the methods of the psychiatrists are revolutionized thereby, it may place another portion of the dark continent of clinical medicine into the orderly and subjugated domain of rational pathology.

THE LABORATORY FOR PSYCHIATRY.

BY THE USE of no mathematical formula, by the juggling of no syllogistic method, but by the argument of clinical, biological and historical analogy, the importance of studying the physical basis of the insanities has been set forth in these pages. Not a tenth part of our evidence and argument of this sort has been utilized, but enough to lead any open-minded student of clinical pathology and pathological histology to predict that a great mine of tangible, priceless and promising pathology lies buried in the institutions for the insane. Far be it from us to disparage the value of re-education and habit culture, far be it from our conception of research to neglect the influence of mental attitude and mental activity on bodily functions, far be it from us to separate mental activity from other functions of the body; but still we insist that the insanities are shown by *all* analogy, and not by the paradigm of one condition, to be the result of physical conditions—conditions that may not be discernible on the post-mortem table, that may not be visible under the microscope, that may give no reaction to present-day methods of research in the test-tube, but conditions that the ingenuity of the human brain and the cunning of the human hand are abundantly able by rational, existing or yet to be discovered methods, to make clear and put under rational treatment and rational means of prevention.

We would claim, then, that it is the duty of the State into whose care almost a quarter of a million

of citizens have been legally placed, to provide laboratories for psychiatry—laboratories to discover the causes and develop cures and suggest preventive measures for conditions that now absorb millions in a worse than hopeless custody. It is the economic and humane duty of the State that wastes a largess of millions on the insane, to establish laboratories for the study of the ailments that bring so many of them to this deplorable pass, laboratories equal in every respect, in equipment, in resources, in faculty and in permanency of position, to the laboratories of the Agricultural Department, established for the study of the diseases of animals and plants.¹

Our notion of a laboratory or institute of psychiatry does not contemplate the erection of buildings or the importation of apparatus and directors. Several States have already built houses called by some such suggestive names. The laboratory, in our sense, is not a place or plant, but a function or activity. It is

1. From "Statement of Balances, Appropriations and Disbursements of the Government, for the fiscal year ending June 30, 1909," we learn that for the Agricultural Department the following disbursements were made for 1909: Salaries, \$1,044,812; library, \$15,902; contingent expenses, \$91,128; bureau of animal industry, \$1,326,452; eradicating cattle tick, \$235,627; meat inspection, \$3,098,760; bureau of plant industry, general expenses, \$933,038; cotton boll-weevil investigation, \$17,060; forestry service, general expenses, \$3,173,404; agricultural experiment stations, \$1,372,776; weather bureau, \$1,500,000; various items, raising the grand total disbursements of the Agricultural Department to \$16,282,468. No one would criticize these expenditures nor would any one with an eye for real economy doubt the sound sense of the several undertakings. The trifling \$16,000,000 seems stingy when compared with \$161,000,000 for pensions, another \$161,000,000 for total military establishment and \$115,000,000 for net total naval establishment.—*Loc. cit.* p. 77, 121, 129, 155.

a system of warfare upon a special sort of inimical ignorance, the results of which are more disastrous than a perpetual international war. For this warfare upon ignorance a concerted systematic research is necessary, carried on by a well organized army of scientific scouts and biochemical sharpshooters. That equipment and shelter are necessary is axiomatic, but the efficiency of such an army depends more upon personnel than on mounting and more upon a deep-seated humanity and devotion to scientific service than to salaries, honors or monuments.

These laboratories should be established in each of several States and by the general government in the District of Columbia and the dependencies, in the response to dictates of obvious duty and economy, and in the hope that somewhere the right combination will be made that will open the door to the discovery of some of the causes of the insanities. These laboratories need not be assembled in one place nor be complete in each of the several institutions, but so systematized and located as to form a unit regardless of locality and dictated by considerations of efficiency, opportunity and propinquity of material.

The system of laboratories should be designed to accomplish three related, perhaps inseparable, but quite distinct purposes:

I. The first function of this laboratory system has been well tried out. It is found in the clinical laboratories of all metropolitan hospitals. These laboratories are service laboratories to the institutions in which they are located. Beginning as small laboratory tables with a microscope and a few reagents, they are

now complicated series of chemical, bacteriological, hemolytic and physical laboratories requiring, for a hospital of two hundred patients, a floor space hardly less than 2,000 square feet, and equipment of electrical, optical, chemical and other apparatus not far short of \$5,000. The uninformed layman, the average doctor of medicine and even a member of a "board of control" may presume that every institution for the insane of 1,000 or more patients would certainly have a laboratory of this sort. It might be hard to convince such a one that these equipments were not the rule. Our experience must have been exceptional if any institution for the insane in the Mississippi valley has an active laboratory comparable in efficiency and service with that of the average metropolitan hospitals of the States in which they are located. One institution of more than 1,000 patients did not have a functioning microscope for several months. One psychopathic institute did not have a microscope, a manometer or an urinalysis outfit in the institution. It was as devoid of diagnostic instruments of precision as a Christian Science temple. Another institute was equipped with all the instruments that are listed in the catalogue, with unimpeachable laboratory tables, sinks, cages, cabinets, dark rooms, incubators and literature, but not a single urinalysis, Wassermann or bacteriologic examination was going on or had been going on since the appropriation for equipment was expended. Such a condition is inconceivable as well as incredible until it is rudely and lamentably discovered.

The first local function of the laboratory should

also include the well-tried methods and functions of a board of health. The population of one of our State institutions is equal to that of a small city. The laboratory should actively care for the health of this community by food inspection, by watching the condition of the water supply, by vigilant supervision of the plumbing and sewerage disposal, by perpetual care of the ventilation and by advice in the location, planning and construction of buildings. The daily ration should be a constant care of the laboratory, and the kitchen, the pantry, the toilet-rooms as well as the storeroom should receive a daily *visé* from the laboratory of no perfunctory sort.

It is not supererogation to say that this laboratory should hold guard over the incoming patients and attendants, and see to it that no extraneous disease is brought into the wards or dormitories. The Wassermann may be a hardship if applied as a routine, but that State hospital is not worthy the name if the hemolytic tests can not be promptly and skillfully made to determine the syphilitic or non-syphilitic condition of patients and attendants. Many an epidemic, afterwards traced to a diseased attendant, could have been averted by the proper inspection of attendant's and patient's blood. The typhoid carrier is no myth. In one series of "sporadic" cases which were studied with unusual care, more than one-fifth were found to have sprung from contact with typhoid carriers. There is every reason to believe that the application of the Widal reaction, together with a careful study of the anamnesis would lead to the elimination of a large part of this danger.

II. The second function of the laboratory should be the educational function. This function is the principal one undertaken at New York, at Ann Arbor and at Kankakee. In all these institutions or laboratories this education is confined to the training of the physicians on the civil service lists. This is a matter of no small concern. These men in Illinois at least are to be grouped in two classes, the passive hold-over men who have slept in the bed of institutionalism for years, ignorant of the rapid advances in pathology, in sociology, and even in "the practice of medicine," and a lot of active young medical graduates, poor and starved, but alive to a possible enthusiasm in a worthy work if led by an inspired prophet of science. They know nothing of institutionalism or its dangers; nothing of the possibilities of medical research. They have never practiced medicine on the sick for their cure, and they have never seen an insane person except leaving or entering the patrol wagon, which is used for an ambulance in taking the insane to and from the court at which they are tried and committed to the State hospital. They have heard lectures and they have had quizzes on insanity as they might have had on the resurrection of the dead, but they have had no more experience with one than with the other.

There is every reason to bring these two elements that must eventually work together into classes for some sort of amalgamation, or, at worst, conglomeration. Too often the baser element prevails and dominates the service ever after with its fateful pessimism. Not enough can be said for the difficulties

before the faculty that would enthuse the whole state service with such an *esprit de corps* as that of the army or navy—a devotion as serious and profound as that of the early Franciscans.

But it is not enough that the custodians of the insane should be instructed in psychiatry. There are two distinct classes of medical men who should be brought to the institute or laboratory and instructed by direct contact with the insane, namely, the medical students before graduation and the physicians practicing in the State. At the present time there are no facilities for instructing either class, and in Illinois there is a rule designed to prohibit a medical society from meeting in the rooms of an institution for the insane or the exhibition of patients for clinical purposes.¹ It would be a decided advantage to the citizens of the State of Illinois if their physicians understood all that is possible of the insanities. It might relieve the State treasury of some burden if they knew what they could learn by a quarterly meeting at the institutions where all the insane are in custody. It is as irrational to make the clinical use of the insane a misdemeanor as it was irrational for our ancestors to make the dissection of the human body a crime.

It is useless to say that this education should be a part of the State system of public instruction, and therefore a department of the university. That is to say, this educational function of the laboratory or institute should be directly under the wing of the uni-

1. Resolution of the House, Illinois Legislature, under Speaker Shurtliff, 1899, relation to meetings of Fox River Medical Society at Elgin Hospital for the Insane.

versity and share in the enthusiasm and spirit of the faculty of that institution with all the possibilities of libraries, laboratories, fellowships and scholastic recognition which university positions afford. The horizon of the university is unconfined by language, race, space or time. From its faculty men would surely come forth who would place the management in a position to do for the insane, for the citizens of the State and for the much-loved taxpayer the wise and right thing.

III. The third function of the laboratory is the one on which all our hopes are placed; it is the function of original research. The problems of the insanities have not attracted their share of attention from fellows in the universities or from the candidates for the doctor's degree in medicine.¹ We have seen yellow fever yield to the assault of well-directed research founded on considerate theory. We have seen the long-sought pathologic cause of syphilis come into the field of our microscope, and more than that, yield us an indubitable hemolytic test, and in the same decade surrender to a single dose of a specific remedy. We have seen, moreover, the sleeping sickness and kala azar come from the fastness of the tropics and surrender to the cunning of wit and the strength of a mosquito bar. There are more reasons for investigating the sources of insanities that place a quarter of a million of our citizens of every class in a hopeless public custody than there was for the study of these

1. Less than 3 per cent. of the theses of the medical students at Paris were on the insanities during the last three available years.

diseases of the tropics. As the problem of syphilis was solved with the solution of the sleeping sickness problem, so we may hope that by such methods as have been successful in remote or rare conditions, the ever-present ignorance of the sources of the insanities may be dispelled.

The research worker must have a laboratory, but it may not be necessary for him to do his work in the institution to which he is attached. There must not only be freedom to think and investigate, but an open choice of place to work. The institutions can not from the very nature of the case have more than "working laboratories." The university and the great libraries of science must be consulted freely and readily. The combination which will open the door to the thousands confined in our asylums might be in the hands of some investigator but for one factor which lies buried in the proceedings of an obscure society.

It is not in numbers that we must rely in our search for the sources of the insanities, but in order to raise up one Pasteur, one Koch, one Metchnikoff, one Ehrlich, one Flexner or one Hektoen we must give free hand and space to an army of aspirants. A State with 15,000 wards ought to provide for one hundred laboratory workers, of whom perhaps one-tenth would be fit for research. Could we have an enthusiastic director, alive to the need, with faith in human cunning, with an impersonal motive, a generous intuition and sympathy and an indefatigable industry and patience, there would center about him from the stream of unembittered young life pouring out of the university, a fellowship of students, servants and investigators that

would make his laboratory as well known as any that the rich history of the last sixty years has recorded.

The practical difficulties of establishing such laboratory systems under joint patronage of the university and charities' board are exaggerated by the timidity and lack of faith of the custodians of the insane and by the repugnance with which the scholastics view insanity and the crimes of the near-insane. The public alone, with a well-fixed public opinion, can sweep away these technical difficulties in a moment. It is unfortunate that few institutions for the insane are in proximity with the university. The University of Wisconsin, which has always shown a helpful spirit in ways unconventional to traditions of the university, has an unusual opportunity to work out problems of the insanities in the State asylum almost on the campus. For the most part, dictated by accidental motives of greed or economy or political expediency, the State institutions are placed in lonely isolation. It is difficult to say how much this isolation has retarded research and degraded the service. Its influence has been bad and is likely to be worse. Man is a social being. The medical and scientific staff on an institution is not alone depressed, disheartened and enervated by the enormity of the problem before them and overcome by the actual numbers of the insane, but they are dragged still further down by the attendant population, a class of devitalized if not deteriorating nincompoops foisted on the service by the lowest sort of political preferment. How can a dozen doctors maintain an *esprit de corps* in a population of 2,000 lunatics and 1,000 time-serving incompetents?

The presence of surrounding physicians at quarterly medical societies, the quartering in the asylum of a bunch of medical, chemical, bacteriological and other technical students from the classes of the university, would not only raise the *esprit de corps*, but would furnish an unaccredited espionage more efficient than an annual legislative investigating commission. The medical services of the institutions would be vitalized by the proper extension of the educational features of the laboratory. The possibility of research depends upon the revival of a new devotion to the rescue of the insane.

The civil service restrictions are perhaps the most difficult to overcome. Their categorical examinations are of such a mesh that no genius can ever break into the service of the State. Civil service bound China for two thousand years or more. We are entering into civil service bondage, out of which no nation has been successfully emancipated. It has all the heart-sickening limitations for the servants of the State that the captains of capitalistic industry have imputed to the citizens under socialism. "But civil service might depart from the categorical examination and allow quality in the place of quantity to count. Under the university the civil service lists might be avoided for the acceptance of research men and women.

In the matter of research the friends of the insane who have the resources could well initiate the investigation of the problems of the insanities by establishing scholarships in the great universities, with prizes for work done. It would be a worthy monument to a lost husband, wife, son, daughter, brother, sister, father or

mother, to place in the hands of some university a helpful stimulus to the study of the physical bases of the several insanities.

The insane themselves are in a helpless position ; the custodians of the insane are hopeless of any possibility of betterment ; the politicians, the legislatures and the mass of the people are ignorant, not to say careless ; it remains for the friends of the insane to bring their case into the court of public opinion and demand that facilities be offered, plans be instituted, to discover the diseases or conditions that lie at the bottom of the insanities.

EDUCATIONAL AND SOCIAL

THE SOUL OF MEDICAL EDUCATION.

THE progress in medical education in the United States during the last fifty years has been most remarkable and inspiring. It may be divided into two distinct periods, that prior to 1890, in which the preceptor, the seven fundamental branches and the quiz predominated, and that subsequent to 1890, in which the laboratory, the extended course of study and the multiplied written examinations prevail. In the former period the time of study was not more than eighteen months; in the latter it is not less than thirty six.

This change has not in every sense been progress. Unity has been sacrificed for unrelated multiplicity, quality for quantity and diversity for intensity. The diet has been varied and the service complicated, but the cooking has deteriorated. The course of study now covers four years of nine months each, and the student's work is measured in thousands of hours divided into hundreds of hours in each department. There is no co-ordination of the studies in the several departments. While the clinical work is in obstetrics, the laboratory work is on the anatomy of the brain and the lectures on ulcer of the stomach. Thus the student cannot have his mind and his work on any single topic continuously. All concentration and intensity, as well as all completeness and profundity are unattainable.

The student "must pass" forty different subjects

and an equal number of men, and this passing must be done in one definite way (usually by a written examination) at one particular time and in one particular place.

There is no "residence" in a medical school to day. In olden times a man could, and frequently did, go to a medical school and take in the spirit of clinical study and medical research. He knew one or more of his professors well and got the torch of inspiration handed down to him in a direct line from the altar of *Æsculapius*. He learned only a small amount of medicine, but he knew how little it was; he digested it and was hungry for more. He went home possessed with a hunger for medical knowledge. To-day our students rarely meet a professor to know him and few professors have the sacred *Æsculapian* fire to pass on. If they have any inspiration at all it is for business, preferment and publicity rather than for service, for insight and for erudition. The enormous and exacting demands of the better class (?) of medical schools are so time-consuming that a man has no leisure for mental rumination and digestion. The school is one continuous cram, one unending grind, one perpetual hustle. Detail, multiplicity, superficiality and the rule of thumb prevail, and all perspective, solidity and erudition are excluded. The students go through the medical school almost as passively as the hides go through the factory to be turned out shoes.

The reason we have the factory system in medical education is easy to find. It is because of the indus-

trial tyranny. The public schools of the United States are under fifty different autocratic and wholly independent departments of education, yet the methods, plans, curriculum, systems, text-books, equipment and even architecture are uniform and monotonous. The homogeneity of the republic is manifest in this fact. The German Empire, the British Isles and the French Republic each present far greater variations within their national educational systems than does the United States.

In medical education we show the same conformity to a national ideal that is so obvious in the public school system. The several State boards prescribe within their own jurisdiction educational rules and limitations that are by courtesy, custom and economic interdependence operative in a whole nation of fifty sovereign States and Territories. The number of years, months, weeks and even hours that the student must be on the ground as well as the curriculum of studies are prescribed; the number of examinations, of laboratory or dissecting hours and even the season of these hours are dictated, and the time, form and number of special clinical observations set down in detail. Such ironclad limitations and regulations do not prevail in the medical schools of monarchial Russia, imperial Germany or bureaucratic France as our self-supporting and absolutely unendowed and unsubsidized medical colleges placidly accept.

The Association of American Medical Colleges, which has been in existence for twenty years, and

the latterly organized Council of Medical Education of the National Association have each extended the sphere of external influence in the internal management of the medical school until now the officers of a medical college are about in the position of a local railway station agent in a union station handling business for three or four railways and receiving almost daily instructions from the passenger and freight departments of each of them and from the State and National Railway Commissions besides. In the multitude of clerical details the so personal and so intangible spirit of education is crowded out.

By an entirely different force the energies of the medical school, are set to another task—that of material display. Our time and our country above all others is possessed by a frenzy to dazzle by the ostentatious manifestation of the possession of material resources. Brick and mortar, marble and granite are far more conspicuously advertised in the calls for students than the theses or other achievements of former graduates or of the members of the faculty itself. The essentials of medical education are overshadowed by the accessories. Education is not an acquisition; it is a process. A medical education cannot be given by a medical school; it can be pursued only by a medical teacher and a medical student in the immediate interest of a patient. The patient furnishes the adequate motive, the teacher suggests by example and by precept the expeditious method, the education springs from the effort of the student to relieve or cure the patient. Just so skill and strength is devel-

oped in the sailor by sailing in a well-managed ship. The ship is a secondary matter. A better sailor may be made on a two-hundred-ton whaler than on a twenty-thousand-ton ocean greyhound. It does not take a model marble Acropolis or a ducal Italian palace to keep alive the fires of Æsculapius, to arouse the attentiveness of a Sydenham or a Kraepelin, to develop the cunning of a Paré or a Parks, or to incite the spirit of martyrdom of a Carroll, of a Lazear or of a Ricketts. It is the intangible spirit after all that marks the difference between the professional doctor and the successful pill peddler; between the alert surgeon who cuts when he must and the deft operator who cuts when he can. It is that same intangible spirit that gives all the honor, position and public confidence to our profession that makes it possible for the graduated and licensed medical tradesman to build up his economic successes on our professional degradation and at the price of our ethical standards.

There are at least three phases of this intangible spirit that ought to be found in every medical teacher—the scientific, the pedagogic and the professional. No man is fit to be a medical teacher who is not an enthusiastic student. He should be acquisitive, alert and scholarly in his own educational progress. The condition of every medical subject is like the market, always moving and always changing. A man's medical vigor is shown by his productive activities. If he produces nothing for medical progress in the medical press his efficiency and potency stands questioned. If

his name is not found in medical literature it stands unsupported on the faculty list. Only original research fits a man to be a teacher. The medical teacher ought also to be either a natural or an educated and trained pedagogue. The educational value of a medical course ought and may be as great as that of a literary or scientific university course if this course is conducted with psychologic good sense and reason. The discipline of a course in human anatomy ought to be as educationally correct and as culturally valuable as a course in physiography if the teachers are equally good men and equally good pedagogues. It is the work of the student that educates, the quality not the quantity of his work. The quality of a student's work rarely rises higher than his teacher's ideal.

Our medical teachers have paid too little attention to their methods. They have tried to produce paragons of knowledge, not enthusiasts of research. They have gone over the subject with their class rather than secured an excursion of each member of the class into the subject. They have tried to present the subject rather than lead the student to a mastery of the subject. They have aimed at the abstract rather than the concrete. Facts have been magnified while relations and methods have been minimized. The patient has been kept in the background as an abstract composite rather than in the foreground as the great motive. The appeal has been made to the intellect and reason when it should begin with the affections and emotions.

The medical teacher should be a member of the

medical profession and devoted to its honor and its interests. He should not be in the pay of any other interests, social or economic, governmental or sectarian. The only pay a medical man should accept must come from a grateful patient. Membership in a medical society does not make a professional man in the sense of this theme. The most blatant quacks have been not only members, but the censors of medical societies. Professionalism is a matter of the conscience and the soul. It is the ethically educated social spirit of the medical man. A good doctor is made of a well-educated man who feels deeply the needs of the sick and believes himself called to live and work for their cure and the prevention of the same diseases in the well. This consecrated man must be educated in all that the labors of medical men in the past have discovered and be guided onward to the very boundary of our exact science and into the disputed territory of ignorance and perhaps of superstition. These excursions should be led by a veritable medical scout who has in practice all the arts of pioneering, adventure and discovery. The motive for all these efforts in education should be constantly kept prominent and the forgetful medical student should be tripped by his teacher into perpetual consciousness that *it is the duty of the doctor to cure his patient*. By precept and by example, in season and out of season, he should be educated in the social and ethical principles and traditions of our profession. Only by men of scholarly attainment, pedagogic skill and professional integrity can such an education be conducted.

THE GROWING FUNCTIONS OF THE STATE UNIVERSITY.

THE history of the university is the history of culture. Each age has its ideal and each country modifies that ideal by its national idiosyncrasies. The oldest of all universities, the most influential at home and least modified by the past two thousand years, is the University of China, as exhibited in the civil service system of the Celestial Empire. The conservatism of culture and erudition was never more manifest. Its tenacity to precedent is comparable only to that of our common law and our Anglo-Saxon lawyers. With us the university is as various as numerous. The University of the State of New York most resembles the Chinese model. It is a great, though as yet uncredited, civil service system. The University of Virginia is an English school planted in an English colony. The University of Michigan is a democratic educational engine, supported by a liberal State. The University of Wisconsin is all that, and an informal advisory body to the State legislature. And so we might go on and show many a new function the university has somewhere undertaken.

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The new schools which are added from time to time to the sisterhood of colleges that make up the university are no innovation since the exclusive circles of theology, law and medicine have once been invaded

by science. Not all of our universities have schools of library science, not all have schools of forestry, but it would be no shock to the educational public to learn that any university had established a school of aerial navigation. To teach anything or everything is one of the accredited functions of the university, to certify to equipment and achievement is another acknowledged function of the university, but to give advice to legislative committees, to present historical, scientific and cosmopolitan vistas of any particular subject to a legislature has not yet been demanded of many of our State universities.

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The university should be a sort of conscience of the State. When the annual budget comes up the paring begins. A million dollars is demanded for a State prison, another million for asylums for the defective, the insane, the deaf and the blind, and a half-million for a school of medicine and a school of veterinary science. The prison will be built, and most likely the asylums will suffer only moderately, but the schools of science will be cut down or out entirely. If the university was called upon it would show to a way-faring legislator that the prison is an inhuman, disgraceful and transient monument of the ignorance, extravagance and thoughtlessness of our present civilization, and better things would be suggested. The bulk of the prisoners are defectives rather than delinquents, and should be cared for and cured rather than punished. The source of the delinquent and vicious

defective should be guarded in the public schools and the injury to the individual, to society and to the public treasury forestalled. The university could advise, if it were called upon to do so, that the sources of insanity, mutism and blindness be studied and guarded by such means as a thorough knowledge of the subject suggests. Certainly a goodly percentage of all the expenditures for prisons, asylums and schools of defectives should be expended through the university or other bureau, in permanent means of preventing the occasion for these expenditures.

The Department of Agriculture and its experient stations expend more money each year than any university in the world, and all to study the diseases of cows and hogs, cotton and corn, and prevent economic loss. Yet it is one of the most effective, benevolent and economic activities of our Government. It is the department that comes nearest home, excepting only the postoffice, and has most enhanced our reputation abroad.

* * *

The State university is now called upon to educate to certify, to investigate, to advise, and it should undertake to coordinate the various functions of the State by advising the legislative and executive departments. The department of sociology, for example, and the department of medicine should have students by the side of the students of the departments of law and engineering in the State prison. There they should investigate, as students alone can,

the conditions precedent to the conviction and succedent to the confinement both within and without the convict, each with the bias of his own department and training. These studies should be considered as a university topic for action in life, in law and in the development of the commonwealth. How easy it is for the medical man to see why so many convicts become insane and why such an excessive proportion of long-time men die of consumption. Is it as clear to the scientist and lawyer? Only the young can learn outside their accustomed routine or horizon. The students from all departments carry the same fund of opinions.

How easy the medical man at the school for mutes sees the possibility of diminishing mutism by preventing epidemics of scarlet fever and by rational treatment of the disease for the prevention of complications due to secondary mixed infection. His colleagues from other departments would not fail to be convinced of this. But why multiply illustrations?

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This is often referred to as the age of specialists. While there should be some reservations and limitations in accepting this statement, for our purposes it may pass. The university makes a specialty, then, of being consciously wise. This has been the specialty of the university for ages. It has not always, it does not always, impart this wisdom. The State university does not always use this wisdom to direct the actions of the State.

There are pedagogues who say doing comes before knowing. It is axiomatic that the knowing that accompanies doing is incomparably superior to a knowing without doing. A university that does is far more alive than one which simply stamps that which has been done—one that certifies to the doer. The thesis was once the only evidence of the doings of the university. Now we have a Babcock separator, a system of cheese making, a nitrogen-producing vaccination of the soil, a thousand additions to our chemical and therapeutic catalogue, and no end of electrical and optical achievements.

But greater than all these we have the intimate relation between the university and various departments of State government in Wisconsin and California, and the growing activity of the university in the agriculture, education, mining, manufacturing, transportation and so-called charities of the State.

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What, then, as medical men should we expect of the university? A thoroughly aggressive medical school, such as the University of Michigan, has begun; an inclusive system of certification such as the University of the State of New York maintains for the degree of doctor of medicine as well as for every other scholarly achievement; a helpful bureau of preventive medicine, a laboratory of diagnosis and investigation, a department of sanitary police, such as the Board of Health of Illinois furnishes, and a school or laboratory in every institution supported by the State,

in which school sources of the errors which made the institution necessary, are studied with a view to prevent them from arising in the future.

Every activity of the university in doing what its knowing indicates should be encouraged by every medical man. In the old university, in the three colleges of theology, law and medicine the equipment was the same, the sole aim to teach to know. The medical school was the first to break with tradition and took in the laboratories of chemistry and biology. For half a century the struggle between the classics and the sciences has been going on. Now the struggle between knowing and teaching to do and knowing and teaching by doing is just beginning. If the correspondence school and the local schools take off most of the burden of teaching by the didactic method, the university can have the energy to serve the State by doing that which its prescience may easily achieve. If the aim of the university is to better by its wisdom and conscience the condition of the citizen, it may well follow the Department of Agriculture in its service to live stock and food.

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◆ In our day few great changes are made with the sound of trumpets, pageants and acclaim. The new functions of the university are stealing quietly into operation and favor. The experimental farm at the university is not far from the antitoxin and vaccine laboratory. The school of nursing is not many steps from the school of medicine. The water survey is not

unlike the testing of the roller-towel habit and the common drinking-cup. The testing of herds and dairies is not materially different from the inspection of schools and communities. These activities are all functions of the State, executed by those who know and naturally the vested right of the university. If we are a people of such general integrity and devotion to duty, that we take a far-sighted view of every activity, then the university may become the conscience of the State, and the public conscience will be on the horizon which cosmopolitan history, scientific prophecy and a modest philosophy alone can secure.

WHO PAYS FOR MEDICAL EDUCATION?

THERE is a plethora of unfavorable criticism, if not of abuse, of the thoroughly disreputable medical college. Medical education is bad, just as bad as it can be. In the very best medical school, Johns Hopkins, the curriculum is rigid, the methods uncultural and the student is far from both patient and teacher. Medical pedagogy is about on the same plane as pedagogy in the New England College. At Harvard and Columbia the same misconception of education is apparent if not glaring. Knowledge is set forth instead of education. Equipment rather than development, results rather than power, attainments rather than intellectual acceleration, achievement rather than enthusiasm to serve, a spirit of judicial pessimism rather than a fervor for pioneering adventure and clinical conquest—these are the ideals of medical teachers in the hierarchy of medical schools. The result is a highly specialized intellectual and social machine, with no adequate motive power, with no *vis a tergo*.

In furtherance of this cramming process to the exclusion of education, the condition of the students' previous education (?) is a large factor. Most graduates of our literary schools are crammed, jammed full intellectually of undigested and unusable material. All enthusiasm, all mental hunger, all spiritual aspiration has been crushed out or displaced by pessimistic philosophy and pedantic discipline. It is a *faux pas* to be interested profoundly in anything ex-

cept sports and fads. To be *blasé* to all the serious problems of life, of society and of government is the fruition of modern college education. The minds of these medical neophytes are morphologically monstrous, but physiologically as dead as a sparkless gasoline engine.

One of the most alarming signs of the decay of our national virility is the trifling attitude of the pressed-brick product of our over-endowed colleges and universities. The students graduate knowing everything, more than they want to know, knowing all that has been said and done, but doing and having done nothing. and, more than that, wishing to do nothing, and believing that nothing is worth doing. With this sort of material alone the best medical schools deal exclusively.

In the inferior medical schools the raw material for education is about as bad. The high school is the people's college and apes the endowed college. The system of education is in many, though not all localities, quite as unpedagogic. In so far, however, as it robs the student of less years, it is less destructive of our hopes for his future educational possibilities in medicine. In so far as it is plebian as compared with the aristocracy of the college, the possibility of a second growth of inspiration and of enthusiasm in education in the medical school may be occasionally expected. The very youth of the high school graduate, the un lumbered and unprejudiced condition of his mind, the curiosity and spirit of adventure of the inexperienced and the noble sentiments of the self-re-

liant and often self-supporting rural or village boy makes him quite as good material for an effective medical education as the older, over-trained college graduate.

Twenty years ago the writer endeavored to attract graduates of the best colleges and universities to a medical school for which he stood sponsor. The effort was moderately successful, but none of these highly educated men led their classes in medical culture, scholarship or enthusiasm, nor did they subsequently prove themselves worthy the attentions and favors that were offered them. Several of them have become salaried servants of rich exploiters of labor and the natural resources of the commonwealth; several have become blatant quacks, but the most of them have settled down to a commonplace but a complaining obscurity. Not one has made good the ideal for which he was sought, and the writer has set it down to his own long list of well-meaning blunders that he dissuaded so many men from careers which they might have honored to one which they have failed to appreciate.

That medical schools are rotten, inefficient and unpedagogic, we must all freely admit, but the results, even the possibilities of any medical education depend upon and are limited by the quality of the education given the medical novice in the colleges, the high schools and the grammar schools. Until our whole public education is made pedagogic and educational instead of effeminate and sapless discipline, no great revolution in medical schools can be expected to ac-

comply really beneficial results. The students come to the lectures, laboratories and clinics, expecting to be instructed, not educated; they expected to be told and shown, and not led to think and to discover. Like the trees in a bad botanical garden, the pathological specimens, the clinical cases and the therapeutic measures must be conspicuously labeled. The whole trick is to use names and answer questions. Bottle-fed in the grammar schools, pap-fed in the high schools, stuffed in the colleges, they expect to be fattened on predigested nutriment or passively filled up by a sort of educational stomach-tube in the medical school. A successful oarsman for the lifeboat cannot be made by over-nutrition and gymnasium machinery, and no more the medical man by passive methods of a would-be education. When the novice comes to the medical school after six or eight years of cramming, any serious, active or strenuous mental and physical endeavor in medicine is not humanly probable.

Seven years ago the teachers in three contiguous if not rival schools, met to discuss pedagogic methods in medical schools. Several men were present whose names lend luster to American medicine or American biology. The discussion was free, familiar and radical. The conclusions of the several conferences were a credit to the intuition and incisive judgment of men used to looking the inevitable squarely in the face. It appeared to them that competition with men educated by such a method as these conferences proposed would put every one of the present medical consultants out of business. The expense of such education would be

far beyond the resources of the medical colleges. The restrictions of State examining and licensing boards would greatly embarrass any college undertaking such methods. The conferences were interesting diversions, but otherwise ineffectual, and are now forgotten history.

It is therefore interesting to compare the financial and physical resources of the medical schools of the United States with the resources of other professional schools and the schools of technology. The 144 medical schools of the United States reported to the Commissioner of Education (1909) 22,158 students, of whom 4,484 graduated (20 per cent.); 1,605 of these students had college degrees on entering. The medical education was conducted with equipment valued at \$12,583,981, and by the help of endowments of \$3,468,734, or \$156 endowment for each medical student. The average fee of a medical student is less than \$200 per year. The course of study requires not less than four years, and yet a very considerable proportion of medical students take a hospital interneship requiring two years more. The professors are for the most part unpaid, receiving return for their time and labor only indirectly through acquaintance and consultation. So far as they are concerned, the medical school is a part of their bureau of publicity and promotion, a business necessity.

The 163 theological schools, with 10,218 students, 1,775 of whom graduated during the year, or 17 per cent.; 3,335 of those students had college degrees. The buildings and grounds (dormitories, etc.) were

valued at \$19,766,100, and the schools had endowments amounting to \$32,024,000, or \$3,134 of endowment for each theological student. This does not include all the aids to theological education which ought to be reckoned with. Students from certain districts are given additional aid by local societies and perquisites follow, even pursue, the neophyte of divinity until his delivery from the educational machine.

The meager physical outlay necessary to a most luxurious divinity training is sufficiently obvious, nevertheless \$19,000,000 are appropriated to the use of 10,000 students, or nearly \$2,000 for each man.

Every one who knows anything about a medical school is appalled by the enormous expenses connected with the laboratories, the dispensaries and the hospital work as now conducted. The ideal would be far more expensive. Theological and legal education is cheap compared with medical training in actual physical equipment and physical outgo.

The military and naval schools are national institutions. The admissions, at about the age of seventeen, are made by two radically different methods, by geographical distribution and by political preference, on the one hand, and by rigid, pedantic scholastic and physical examination on the other hand. There are always vacancies in these schools. The students have no fees or expenses to pay, but, on the other hand, they receive \$500 a year stipend and at last a commission and salary. Only the most elementary military training is given at West Point. This is supplemented by a more technical and practical training in army service

schools at Ft. Leavenworth and the engineer's school and other special service schools at Washington and elsewhere. Only 23 per cent. of the officers of the army are graduates of the military academy. The deficiencies of the West Point training are further recognized by officers of the line in the increasing respect shown men who come up from the ranks of civil life. The appropriations for West Point with less than 400 students was \$573,000 in one year.

The sixty-four agricultural colleges have received from the United States government somewhat more than \$106,342,680 as a permanent fund. They derived from this source, from State appropriations and other sources, in 1908 an income of more than \$6,406,982. It is difficult to give the number of agricultural students accurately on account of the fact that many are enrolled in several schools in the universities with which the agricultural schools are connected, but in 1908, 6,282 graduated and about 26,000 were enrolled in regular courses. This means that agriculture has an endowment equal to \$4,000 for each student and an income of \$250 a year for each student. The resources of the schools of engineering, electrical engineering, forestry and other technical pursuits are so mixed in their budgets with the universities that their resources are difficult to estimate. A single school of technology, however, with 1,500 students, has an endowment of nearly \$2,000,000 and secures aid from the State and other sources to a considerable amount. The total income for a year (1905) was a little more than half

a million, and the annual expense left a deficit of more than ten thousand dollars.

The results of this technologic teaching are not more satisfactory than are the results of the medical teaching in the best schools. The men are not all leaders in engineering, and few, indeed, are pushing into new fields. The ethical standards of engineering are not higher than business standards with which engineering is so intimately associated. There are high-minded engineers who are as professional in their work as the most conscientious physician, but the rank and file are certainly below the rank and file of physicians in ethical relations between themselves and between themselves and the public. The prizes in engineering are greater than in medicine, but the mediocre man has far less reward and a far more insecure position than the doctor. Why technology is so much better endowed than medicine deserves further consideration.

The relations of the medical school to the university is another matter of extreme interest. When that university is a State university the complications and possible interests are multiplied. The private and traditional university is essentially aristocratic, and, as the economist would say, capitalistic. The endowments are invested in mortgages, in buildings and land, in stocks and bonds in various industries. The university becomes a political factor like any landlord or other exploiter of labor. These interests cannot fail to show themselves in the management of a medical school as well as in every other department of the university. The freedom of the teacher may not be obviously cur-

tailed, but the general direction of medical research cannot fail to be modified by the interests of a university corporation in tenements, in manufacture, in lands and in transportation. The projects of every university are thus turned, even at the slightest angle, by endowments and its particular methods of investment.

On the other hand, the State university, when it ceases aping the traditional university, will be more largely influenced by civil service, by the needs of the penal and custodial institutions of the State, by the economic interests of the commonwealth and by the various State activities. The origin of the State university was distinctly democratic. It was designed to be the dome of popular public education. In each State it has developed with certain local modification under the general traditional scholastic public opinion of the professional presidents and professional professors. Now it is difficult to see the difference between the better State universities and the older endowed universities, and, moreover, professors pass without losing much caste from the latter to the former. If we make a differential diagnosis between the spirit of the traditional and the spirit of the State university we shall find that the former is scholastic, pedantic, conventional, complacent, timid and critical. The latter is democratic, utilitarian, venturesome, ambitious. The former has the poise of age, the latter the exuberance of youth. The former is cosmopolitan, the latter provincial.

It is extremely unfortunate that many of our State universities follow too closely the fashions of the pri-

vate foundations. Thus they become imitative, inane and ridiculous. The State university should be the conscience of the State, an intellectual court of last resort, an automatic source of corrective prescience, of legal prescience, of judicial prescience, of economic prescience, of sanitary prescience and of social prescience. The hope of the permanency of our present civilization rests in the adoption of rational modifications of our laws, our conventions and our social relations. Through our great conquest of nature our material resources are almost unbounded. With the meager assistance of medicine the death-rate of the first five years of life has been reduced to a tithe. Many dread epidemics have been robbed of their horrors. The hospitals of the world have been multiplied a hundred-fold in their effectiveness. Even war is robbed of half its terrors, and more than half its destructiveness by sanitary and surgical science. The greater and the more constant danger of society from the delinquent, the defective and the dependent classes is so complicated and imminent a problem that it requires all the wisdom of all the faculties to find a way out. That this problem will be solved no one who appreciates the fertility of the human mind can doubt. Much of the research must be done in the medical laboratories and all of it under the guidance of thoroughly practical clinical men. An ideal medical school would be an ideal place for the State to work out the problem of self-preservation. The nation supports its war college; the State should as liberally support its col-

lege of peace. The nation supports a magnificent navy; the State should support with equal prodigality the laboratories for saving life and preventing suffering.



PRACTICAL HYGIENE IN THE MEDICAL SCHOOL.

THE morbidity of medical students is proverbially excessive. Out of every graduating class of one hundred there are two or more graduated *in absentia* on account of active tuberculosis.

So far as the writer's knowledge extends, no medical school in the United States has any physical examination on admission, and no medical care of its students during the course of study. The amphitheatres, laboratories and classrooms are far from models of sanitary construction, and the janitor service and conditions of existence do not savor of care for the health of the students. A glance at the schedule of lectures shows that an inordinate amount of time must be put in by the student in the over-heated, dusty, nasty, lecture-rooms and in surroundings which would be dangerous enough if the students were exposed to them only a few hours a day.

The students themselves are at a critical period of life. They range between nineteen and twenty-six. The powers of nature make over-work easy, and ambition and passion rule as at no other period of life. The traditions of the medical school are in the direction of non-conventional conduct and freedom from all restraints. As a rule, medical students drink too much, smoke too much, and are too free with women. They do not eat enough, sleep enough, nor have enough recreation in the fresh air. They befoul the lecture-rooms

and amphitheatres with tobacco smoke and expectoration. They sleep in close, over-heated rooms and read unseasonable hours with poor or badly arranged lights. So far as our experience goes, no student group has ever made any systematic effort to improve the sanitary conditions of the whole student body. The anti-tobacco and anti-alcohol crusades of the Y. M. C. A. groups have not had such a foundation as to command the confidence of the student body.

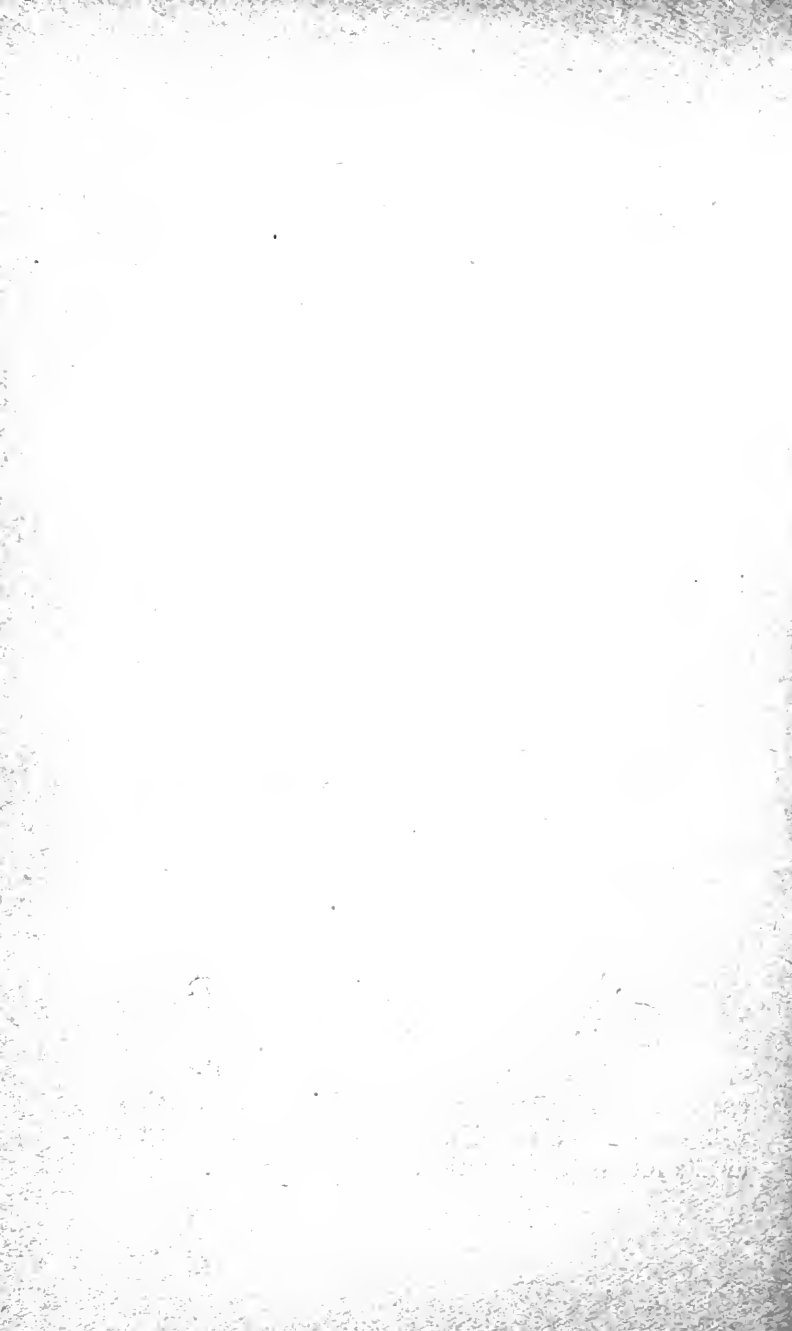
The medical faculty is growing from year to year more and more out of sympathy and touch with the student body. The management of the medical school is confronted with the enormous growing expense of the modern medical school and the terrible competition which exists between rival institutions. The difficulties of meeting the requirements of the State examining boards and the constant advances in the frontier of the science of medical practice take up the energies of the management, and they have no time to consider the health of the student body or the sanitation of their classrooms. In a few institutions, where new buildings have been constructed, better and more appropriate conditions are attained, but for the most part this is a passive improvement rather than an active betterment. The heart of the medical faculty is not in the health of the medical student body.

Every medical school has a course in hygiene. Theoretical health is discussed under conditions ideally pathogenic. Warming, ventilating, lighting and house-cleaning are presented by the pedagogic method of "the horrible example." The janitors of the medical school,

like the janitors of our public schools, seem to be selected because they are already tuberculous or have all the habits which make them early succumb to the disease.

It stands without saying that the medical school should be ideal in all matters of health and sanitation. Better a sanitary-medical school than twenty courses in sanitation in all the unmentionably nasty medical school buildings in the country. Better that the 15,000 medical students of the United States be trained for four years in personal hygiene and right habits of life than that they pass two majors in the theory of health.

The young medical man gets a rather cool reception when he goes out to do on the people all the brilliant things which he sees accentuated during his four-year course. The people don't want to be laparotomized or have their ribs taken out. They object to having their antrums opened or their mastoids chiseled off, however clear the indications may be to the mind of the young doctor. If, however, he had been active in trying to make the public school house clean and airy, in order to prevent all the colds, adenoids and bronchitises which so often end in serious conditions calling for surgery, he may possibly get some recognition. The young doctor must go forth to counsel the people who become his patients in all the manners of life by which disease may be forestalled. That they are not ready to pay the young doctor for the great operation, has been demonstrated *ad libitum*. That they will pay for the foresight of the wise young doctor awaits future demonstration.



THE MEDICAL ORGANIZATION OF THE FUTURE AND "THE GOOD DOCTOR."

IN not a very remote time and in a not very distant city a physician was once taken sick. One of his colleagues was called to care for him, and all his other colleagues were detailed from day to day to care for the patient's patients and keep his office hours. In time the sick doctor made such recovery that he was sent to Europe for complete convalescence, and his colleagues stayed at home and made regular remittances from his practice, which they maintained in its integrity by a sort of a relay method, for us of 1909 hard to understand. At the end of his convalescence he came back to his intact practice. His office was as full as ever. His former patients were his still and his finances had not suffered more from his sickness than those of a sick merchant or banker. The integrity of the medical profession in that city as well as the integrity of the sick doctor's practice was preserved.

At a recent meeting of a State medical society, the question of medical defense was discussed. The society, at length, by its star chamber, was committed to this adventure. This State society publishes a monthly journal, though it is too poor to provide stenographers to report discussions of the papers read. It now undertakes to defend every member of the State society in every malpractice suit. Whether innocent or guilty, whether capable or incompetent, whether equipped or deficient, he is to have well-paid advo-

cates. It certainly will make this State society attractive to the scum of the medical practitioners who have never before seen reason to put up the fee for membership. It will certainly bring out some of the stay-at-homes.

The two preceding incidents characterize the spirit, the former of a professional society and the latter of a trades union. Any careful observer must recognize the trend of our medical organization, the disintegration of the professional spirit which has earned medicine the respect of the world and given the doctor a social position among gentlemen, and the incarnation of the trades union spirit which breeds strife, strikes and the ethics of the walking delegate and the picket.

The trend of the organization is soulless and iron-clad. Papers must be read inside of fifteen minutes, and discussions must be limited to five minutes. Papers must pass a publishing committee, and be published in the official journal. The society has a committee on political action, and there is no reason to think this committee would object to funds for publicity and corruption. "The fact is, the medical society," as one of its members said on the floor, "is letting ethics and hygiene rest while it tries out business methods in medicine."

This remark made me recall what little remained in my gray matter of business methods learned during the last twenty years. My knowledge of business is naturally very limited in detail, but very extensive in general. It has settled down in my Euclid of Ethics that "all business is bad, and that the most successful is the

worst." Now, this doctor would apply business methods to medicine. He would "land" as many operations as possible and soak every one for the biggest fee. His motto would be, "From every one according to his necessity."

I suppose this federation of business-like doctors has come to stay, and that we must make the most of their bumptious methods. We must read their journals, pay their lawyers, collect our bills through their collecting agencies, insure our automobiles in their companies, get our instruments of their instrument houses, refer our patients to their accredited druggists, contribute our mites to their old-age fund and patronize at last their official undertakers. Otherwise we will be called scabs and be treated like scabs.

There is every reason why the medical profession should co-operate in maintaining a medical library, such as that of the Academy of Medicine in New York. There is good reason why the medical profession should erect and maintain such a memorial mansion as the Langenbeck House in Berlin. It may be that to a clearer reason than mine there is equal argument for a physicians' publishing house, an official malpractice defense league, a physicians' instrument and drug mail order store, a physicians' laundry, and so on to the end.

In this mechanical and business-like exploitation of our group, where has that tradition "the good doctor" a place? The answer has not yet been given out officially, and its publication here would be premature, but it may be safely said, as it has been said so often before, that "a sucker is born every minute."



THE INFLUENCE OF THE AMERICAN MEDICAL ASSOCIATION AS NOW ORGANIZED UPON CURRENT MEDICAL LITERATURE.

THE merest glance at the constitution and by-laws of the American Medical Association will convince any one of the undemocratic, though apparently representative, form of government that it secures. There is no place where the star chamber can be checked or the great mass of busy professional men who make up the body of the organization can be heard from. The officers are nominated and elected without any reference to the bulk of the 52,000 members of the association who are not present at the place and hour. The constitution of the association is hard and slow to change. The unrestrained powers which it gives its officers are numerous for good or evil. This constitution resembles that of a great political party. It is devoid of all those features which the thought and experience of the world since the French Revolution have made almost axiomatic. The initiative and referendum, or direct legislation, are unprovided for, and there is no real election of officers—they are simply acclaimed. With an educated body like our profession, preferential voting would be not only easy but effective in expressing the will of the mass, if such an expression was desired by the organization.

Perhaps the rank and file of the profession would not care what sort of an organization managed the meetings were it not for the unpremeditated departure

of the organization into the publishing business. It matters little who reads a paper on colic, but it does matter if one cannot find a place to publish such a paper. Originally the proceedings of the association appeared in an annual volume. The postal laws imposed a heavy tax (eight dollars per hundredweight) on the transmission of books of that kind through the mails. The same end, the publication of the papers and proceedings, could be attained and the mails would carry them for one dollar per hundredweight. The most common sense dictated the establishment of a weekly journal to circumvent the postal rules and the express charges, and in 1883 the *Journal of the American Medical Association* was established. If the pharmaceutical houses taxed us as the express companies and the mails did twenty-five years ago, and there was no other recourse, the same common sense would dictate the establishment of the pharmacy of the American Medical Association.

The establishment of its *Journal* was coincident with the rapid growth of the organization, and was a motive for and an engine in that extension. The *Journal* in the early years had great profit from advertisements, and soon added to the resources of the association, both in influence and in financial resource. It soon became a honey-pot to the medico-political diptera, and as the trustees now had financial plums to bestow, the "ancient and honorable" were displaced by the busy and aggressive. The *Journal* was managed on business principles. The circulation grew with the organization of the profession. The State and (local)

county societies were hitched on behind the association, and star chambers, when they did not already exist in these organizations, were instituted to train into the star chamber of the national association. The State journals were encouraged and bureaucracy entrenched. Now that the position of the clique (or, as one of their number explained to me, the "good fellows who would turn out and give and take") was established, rivals must be eliminated. The private journals depended on circulation and advertisements. If either of these could be curtailed it would cripple the rival. Immediately an *Index expurgatus* of advertisers was promulgated, and every medical organization, through its house of delegates, council or otherwise-named star chamber, was directed to see to the punishment of offenders. And this righteous diversion is still going on.

Current medical literature divides itself logically and naturally by its contents into general medical literature, on the one hand, which appeals to and is read by the general practitioner and all other medical men alike, and the literature of the specialist, which concerns these branches of medicine and is intelligible only to the single class for which it was written. Originally all medical journals belonged to the former group, but of late (twenty-five to thirty years) the latter group has developed enormously, and, in a measure, at the expense of general medical literature. This condition prevails in the several countries of Europe as in America and the Orient.

Again, the general medical literature divides itself

into the local and the cosmopolitan. The local journals are generally of infrequent issue, while the general cosmopolitan medical publications almost always appear once a week.

The scientific and professional value and bulk of this literature varies for the several countries with the remuneration, education, customs, history and habits of the national profession. In England, where the doctors are poorly paid and ranked socially just below tenant farmers and above established butchers, general medical literature is represented by two bulky and chaffy journals—the *Lancet*, privately owned (circulation 10,000) and the *British Medical Journal*, a society venture (22,000). No other European nation makes a worse showing in general medical literature, unless it is the French, with their many little weeklies. Germany, or rather the German-reading profession on the continent has seven great medical weeklies, privately owned—the *Berliner, Deutsche, Münchener* and *Prager medizinische Wochenschrift, Correspondenzblatt für Schweizer Aerzte*, the *Medizinische Klinik* and the *Wiener klinische Wochenschrift*. These journals maintain the highest scientific and literary standards. No better articles, articles from no better men, articles in no better form, are published in the more ponderous and elaborate *Beiräge* than in these weeklies. The scientific value of this literature unquestionably outranks that of the English, French or American journals of general medical literature.

Next to the literature of German-reading Europe stands without question the literature of America as

represented in the five great medical weeklies — the *Journal of the American Medical Association*, a society organ (circulation 52,000), and the four privately owned journals, the *Boston Medical and Surgical Journal* (circulation 6,000), the *Medical Record* (circulation 10,000), the *New York Medical Journal* (circulation 22,000), and the *Lancet-Clinic* (circulation 5,000). Like their German compeers, these weeklies have an individuality of their own. The *Journal of the American Medical Association* puts out about one hundred pages of reading matter and half as much advertising, while the other weeklies give less than fifty pages of reading matter and a little more or a little less advertising.

But it is in the quality of the original articles that we are interested. If in these pages we may express an opinion in which the *Lancet-Clinic* shall not be considered, the four remaining weeklies are neck and neck in the quantity of valuable matter. The *Boston Medical and Surgical Journal* and the two New York journals publish fewer pages of what might be termed *skultch*. In editorial matter the *New York Medical Journal* leads, with the *Medical Record* second. The so-called editorials of the *Journal of the American Medical Association* are for the most part abstracts of literature of more or less timely interest. They are impersonal and often stale. They never give offense or arouse discussion. The abstracts, correspondence and medical news in these great weeklies differ in quantity and quality, but in no one journal is there any great superiority, except in quantity. The association

journal leads in that in every department. Book reviews are unknown in any of our medical weeklies. It is possible the book review is gone to stay. It is possible in these days of card catalogues and special journals that the medical book worthy a review is also a memory. The great men who know how to do things are too busy to write books or read them.

We are interested in the future of cosmopolitan (non-local) general medical journals. Are we to have one American medical journal, just as we have one Congressional Record? Are we to have two, as our English neighbors do, one official and the other a private enterprise?

The active medical enterprise of German-speaking Europe uses more than seven weekly medical newspapers of the first rank. Hardly one of these would be embarrassed by a strict comparison with our best. The university and the open hospital furnish material for these five weeklies, while the library-trained medical profession demands the clinical and scientific weekly.

The medical profession of the United States is being thoroughly unionized by the efforts of the American Medical Association. The process is inevitable, though in some of its aspects unprofessional and lamentable.

The new Harvard Medical School needs a *Boston Medical and Surgical Journal* for effective expression of its spirit and adventure; Columbia, Philadelphia, Johns Hopkins need the *Medical Record* and the *New York Medical Journal*. The new school in Cincinnati

must have as good. Can the universities and the profession allow the complete extinction of all private weeklies? If some active steps are not soon taken we shall find ourselves so completely organized that we shall have no means of expression or redress.



THE MEDICAL BOOK STORE.

THE great influence of the book store on literature and library culture is proverbial. Not to mention more classic examples, the corner book store in Boston was the geographic center of the greatest intellectual and literary awakening of our Atlantic seaboard, and the "Amen Corner" in S. C. Griggs' Book Store was the center of literary life in Chicago.

In medicine, the influence of the book store in Philadelphia made a medical publishing center there, and also attracted to that city medical students and patients seeking medical aid. A long list of names is associated with the development of medicine in the Quaker City, out of which have come forth a number of such brilliant contributors to *belles lettres* that they are almost forgotten as physicians. Now the medical book store in Philadelphia is a memory. The metropolitan cities even have no medical book stores. Medical books are kept in back rooms in some of our general book stores, but the absence of a real medical book store is a conspicuous sign of the evolution or devolution of medicine.

We have called attention elsewhere to the rapid extinction of the weekly medical journal, and we attributed it in a great measure to the unwise, if not unfair, activities of the American Medical Association through its journal. The whole fabric of medical literature has changed much, and the book trade most of all. The publishers now find it pays to put out hundreds

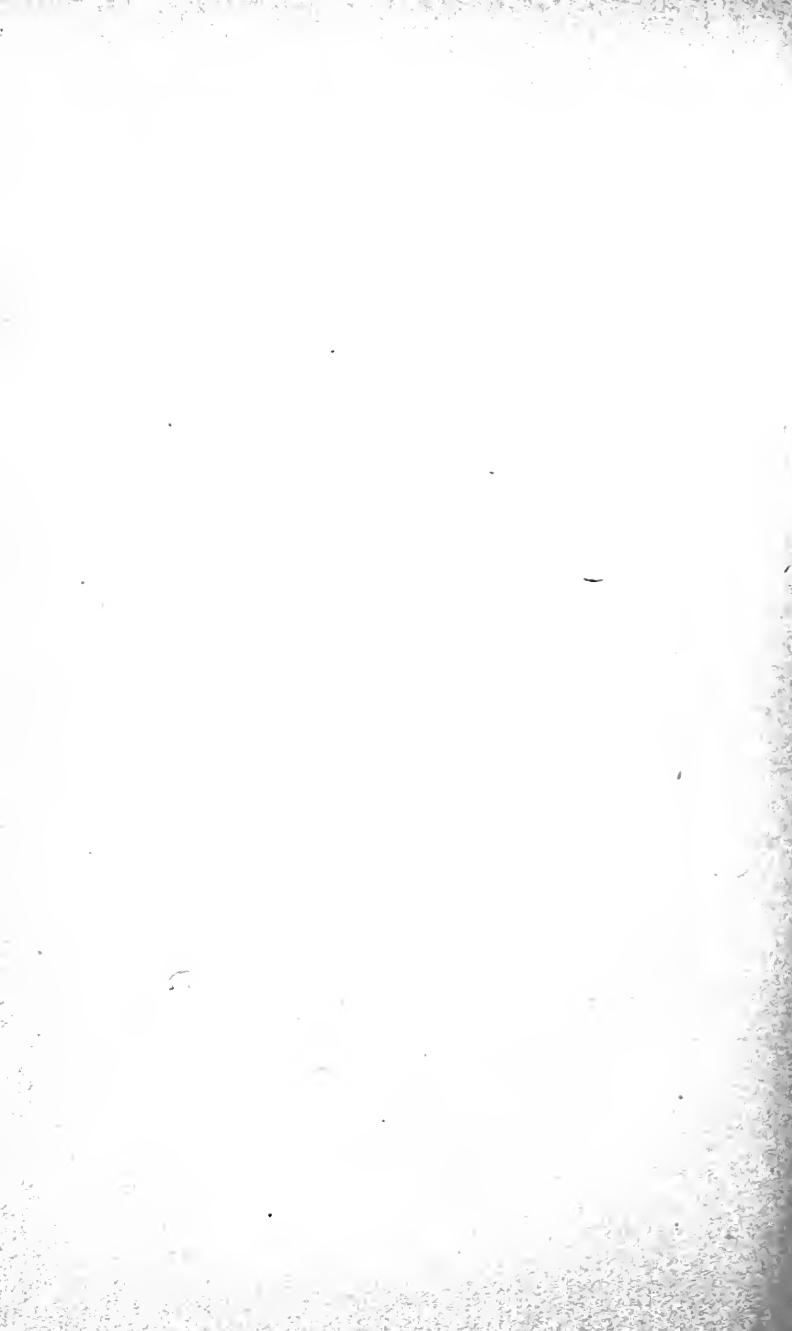
of canvassers who sell by prospectus and subscription only. The books are heavy, big and pictorial. They are often in so-called "libraries" or series of six to sixty volumes, and average about six dollars a volume. The doctor pays by the month to a collector who visits him at definite pre-arranged times. Many of our best books can be obtained in no other way, and they are used to foist more showy or sensational books on the market. We must not complain if the publishers can circulate good books in no other way, but this is one of the functions which has dealt a vital blow to the medical book store.

Another factor which must be considered is the fallacious notion prevalent among physicians that only recent books on medicine are valuable, and that all recent books are filled with novelties that are useful. Many of the best medical books are twenty years old, and a few that every student and physician should read are older still. The great mass of material to be found in the library of a prosperous physician who has freely attached his name to subscription blanks is trash of the most useless and worthless sort. Still, the delusion prevails that new books are good books to buy. Big books and picture books sell by subscription.

There is reason to believe that medical books are not read by physicians as much as they should be. They are referred to and kept on exhibition, but they are too heavy to be perused in these hustling times. The physician has to be up and doing in order to get into the band wagon, and even the band wagon,

when he gets there, does not prove to be a very good place for reading or writing.

What can be done about it? Well, nothing. But let us at least see how things are, and where, as a profession we are going. We are becoming thoroughly unionized in our organization and are becoming *trades* unionized in our practice. We are not in the practice of medicine for our health, and if we read the signs aright the people are getting onto it. They even hint that we are not always in it for their health, and that is what they are paying us for. We have traded pretty successfully—some of us have—on the professional reputation established for us by our predecessors. We still wear the regalia of Æsculapius, but do not always follow the ethics of Hippocrates, Galen, Sydenham and Davis.



THE ADVANTAGES OF TEAM WORK IN MEDICAL RESEARCH.

THE days of individualism are over in almost every department of life. The very essence of our mastery over ignorance and the powers of nature depend on large composite units. It takes a better and more considerate man to be one of a team that it does to work or fight alone.

The prophet and the artist can hardly exist except in stimulating surroundings, though their actual productions are the labor of solitude. The voluntary organization of medical men produces societies, but not often teams fighting on the boundary of science.

It is very difficult to do one's best every time; the artist, the poet and the genius often fail of the highest mark of excellence. Society is not always at its best. There are long periods when it is on the plateau of sordid drudgery. Then there is a sudden rise to a plane of broader vision and clearer conception and achievement.

Medical societies are no exception to this law of protracted mediocrity and short but sudden ascent to a plateau of unusual brilliancy.

For a long time our medical societies have been dreary and sterile. In spite of seeking after strange and false idols, little grain has come from a great mass of chaff.

The meeting of the Chicago Neurological Society, January 27, was an ideal in form, conduct and mat-

ter. It was held in a noisy hostlery, the medical profession of Chicago being still houseless and homeless. This meeting furnishes an immediate model for future efforts of the scientific faculty of every community. The evening was devoted almost exclusively to the subject of hypophyseal disease, which was presented from the three points of view by the neurological, the ophthalmological and surgical members in a most scientific, concise, clear and masterly manner. Dr. A. Kanavel described his method of hypophysectomy by approaching the sella turcica through the sphenoidal sinus, first making an incision under the nose and around the alæ to the prominence of the malar, then cutting through the septum to the posterior nares above the middle turbinates, and raising the nose upward onto the forehead by breaking the root of the nose and using it as a hinge. The upper turbinate and the larger part of the ethmoid were removed, the sphenoid opened and its septum removed, and the base of the cella turcica cut away. The tumor is then removed with a sharp spoon. The anesthetic is rectal etherization, and the blood is kept out of the air passages by a tamponade of the posterior nares as for nose bleed. Kanavel's careful work on the cadaver, and anatomic and pathological studies, well prepared him for the dramatic removal of a well-diagnosed tumor of the pituitary body. The patient did well for six weeks, but died of the progress of the malignant disease, for which the operation was unavailing.

Dr. H. E. Halstead showed a patient from whom

he had removed the hypophyseal tumor which had produced blindness and a comatose condition lasting several weeks. The method of Kanavel was not followed exactly, but the upper lip was turned up and an incision into the nose made by stripping the lip away from the superior maxilla as high as the orbits, and otherwise following Kanavel's technique. Trendelenburg tracheotomy tube and ether was used for an anesthetic. The patient, scarless and restored to sight, and in a normal, useful condition, showed himself.

Dr. Halstead reported a second operation in a desperate case, upon a woman who died shortly after the operation. The plans, specifications, radiographs and technical appliances used in these operations were presented, as well as the history, neurological findings, ophthalmological findings, and all the deductions and indications therefrom were presented by men in whose services these patients presented themselves. Dr. Dean Lewis gave a concise and classical description of the specimens removed, with a masterly summary of our knowledge of the embryologic origin of these tumors.

Dr. D'Orsay Hecht presented a young woman with hypophyseal disease, in the diagnosis of which he had used all the resources of our science. Especially interesting were the studies of metabolism made in the case of Prof. Mathews, of the University of Chicago, and the deductions which the results of the studies warranted.

The discussion by members of the society and

guests was pertinent, active and well taken. The adjournment was made after the contributors to the seminar had been duly commended by a flattering resolution.

This work could not have been accomplished except by the united yet wholly independent work of the men concerned. Each one, a master in his own sphere, helped on the achievement of a distinct advance in the surgery of the base of the brain and in the conquest of a mastery over the internal or auto-genous toxemias.

ORPHANOTROPHISM.

To those of us who really want things done by society, she seems obstinately slow. This slowness is apparent rather than real. When she really gets agoing she makes this old world hum. When Socrates was a boy, Athens was a village of thatched houses almost hovels; when he drank the fatal hemlock, it was a city of marble palaces and temples adorned with the sculpture of Phideas. An equally great intellectual revolution had gone on with this material and artistic advance. As remarkable examples of great world movements might be cited, those occurring during the life of Columbus, that of our own fathers and even in the short span of our own unfinished lives.

History has not always set down the unconscious acts of society. The spirit of the time, the *Zeitgeist* and the *Weltgeist*, are so encompassing and engrossing that no historian has the perspective to conceive and narrate the doings and achievements of his time. Many of the social advancements in which we are interested to-day were brought about unconsciously, many so remotely that all the records of the events are lost.

If we attempt to meander the uncertain course of human progress in culture, civilization and self-mastery, no evidence will be found more profoundly suggestive of the deeper psychical conditions of each succeeding age or more curiously conclusive of the

complete moulting of the old ideal and the adoption of the new, than the linguistic driftwood found in obsolete and abandoned words cast away by the languages because of unpleasant associations. The psychiatrist would find the skeleton in the closet of the deluded mind by noting the words which the patient shies at; so civilization shies at words that spell disgrace to a preceding era.

It stands to reason that with new ideas and associations new words are adopted and coined into the vernacular. As the murderous and pastoral barbarian became a settled tree-growing agriculturist, private property and the exclusive family arose, and with it that vocabulary necessary to express the new ideas and relations. Part of this new vocabulary came by modifying the meaning of old words, part by the acquisition of foreign or newly manufactured words. While barbarism and a patriarchal, tribal society lasted, no child was the exclusive son and heir of anybody, and no child was therefore an orphan. This word and the idea it stands for came with private property and the exclusive family. In the Greek, *orphanos*, from which our word is derived, was used as early as Homer (*Odyssey*, 20, 68). It was taken into the English language by way of the French ballads, which were translated into the vernacular of Britain about 1300-1350, and appears in "Kyng Alisaunder" (line 4947):

"Another folk woneth there beside,
Orphani hi hatteth wide."

Then the bard goes on to say that these distant people had so many orphans because of a kind-hearted custom which eliminated the feebly aged at the hands of the children.

In Caxton's Chivalry it appears also (1484) in the lines, "The office of a knyght is to mayntene and defende wymmen, widowes and orphans." (13.)

Even in the earliest years of orphan-mungering, the evil effects of institutions upon the child were observed and recorded. In North's Plutarch we find the following: "Orphanage bringeth many discommodities to a child." (185.)

We endure our abuses of orphanotrophism even when they are repulsive to the heathen Chinese. In the *London Daily News*, of December 16, 1871, we learn that the Chinese government "*demand the suppression of the foreign orphanages.*"

There are many derivatives of the root orphan in our dictionaries. Each stands as a blatant witness of our cruelty to children.

There is, however, a continent in which orphan, orphanage and orphan asylums are unknown in the legal code. In fact, it is a continent without an orphan, and their vernacular no longer needs so cruel a word except for historical purposes. America is without a lunatic asylum; a few States have insane asylums, a few more hospitals for the insane, and most of them have State hospitals, but the insane are still with us. Australia, however, does not have an orphan asylum nor an orphan. Every destitute child is at once mothered and fathered by the State. The foundling, the

deserted child and those bereaved by death are at once the children of the State and the Children's Council is their guardian.

It came about in this way: When South Australia was a small community a certain Miss Clark and the late Miss Catherine Spence undertook to place out among farmers the destitute children of Adelaide. At first they served without legal authority, but later they secured an act establishing a Children's Council. All matters relating to dependent, delinquent and defective children were placed in the hands of this Council.

The destitute child is taken to the Children's Court and placed in the care of the Children's Council. He is then boarded out in a good family. If he has a sister, she is placed with him. These children and their home surroundings are regularly visited by a voluntary local inspector, by a paid traveling inspector, by a local paid physician and by a local police officer. Written reports are made to the Council. Once a year one member of the Council visits the home and the child.

When the child is of school age, the schoolmaster sends in a monthly report to the Council as to the child's parents. The child is one of the children of the State, and no longer either an orphan or a pauper. The law of the Continent knows no such thing as an orphan, even the press and vulgar conversation echew the word. It is cast out of the living vernacular with a long series of words which could be mentioned, if the printer would not refuse to set them up.

When the child is of sufficient age and strength he

is allowed out of school hours to work for wages, which are deposited to his credit in the postal savings bank. When he approaches such an age or condition as to require or desire schooling or apprenticeship at a distance, his preceptor in the Children's Council recommends some such course, and he is allowed to use his savings in continuing his education.

If the child is defective or delinquent, he does not pass out of the care or control of the Council on coming of age. The problem of the defective child is little better solved in Australia than with us; however, the sources of defective children are strenuously guarded. Employers' liability insurance, the public ownership of the unoccupied land, graduated inheritance taxes, graduated land taxes, graduated income taxes, personal responsibility for corporate crime and other evidences of corrective legislation favorable to the young and the unborn, are all designed to favor parenthood and secure for every child a childhood free from toil. Our country is possessed of innumerable orphan asylums where 100,000 children languish. These orphanotrophies, as Johnson calls them, make the poorest citizens possible out of our orphans. The death-rate in all foundling and orphan asylums is so terrible that less than a *tithe* survive the first five years. Even those that live are scuttled by disease. They have spectacles, but cannot see; running ears, and cannot hear; adenoids, but cannot sleep without snoring, and enlarged tonsils, but hardly escape rheumatism, gastric ulcer and appendicitis. They do not learn to live outside of an institution. Consider what is open to a boy or a girl brought up in a great orphanotrophy, steam-heated, the fires

under whose boilers never go out from one year's end to another! He cannot build a fire, do the chores about a house, care for a horse or stable, milk a cow or feed and harness horses. He does not know even the names of ordinary household duties. He cannot care for his room or his own clothes. The girl is even worse off, if possible.

Our homing societies are private, unauthorized and unsupported. If they place children out, they lose all authority and control over both child and foster parent. Many serious conflicts thus arise, which bring discredit upon the method and bolster up the child-devouring orphanage.

1. The orphan asylum is a cruel Moloch which destroys the children placed in its care, a disgrace to society in feeding the brothels and adorning the rogues' gallery, in putting out defectives and incompetents into the labor market to beat down wages in the lowest trades, an expense to the State which must ultimately pay dear for delinquency which benevolent but unthinking cruelty to the child surely entails.

2. Placing out the dependent child without authority, by private societies, is inadequate and scandalous, and has the merited disapproval of the public.

3. The only adequate, rational, humane, economic and safe method of disposing of the dependent infant is the method of Australia, the permanent adoption of child by the State, with all its authority, its resources, its organization for control, sustenance, guidance, inspection and education; namely, placing out with foster parents, with authority, compensation and inspection.

THE BURIED TREASURE, OR THE NEGLECTED ABBOTT OF BRÜNN.

THE present age values everything in gold, and cheapest of all things is the man. Yet when we look at the advances of civilization we can see innumerable illustrations of the fact that man is all and everything in the progress of the world—Socrates, Phidias, Michael Angelo, Raphael, Cuvier, Agassiz, Galvani, Faraday, Paré, Pasteur, Koch, Ehrlich, Darwin and Mendel.

In a recent editorial in THE LANCET-CLINIC reference was made to the buried and forgotten, but at last epoch-making, contribution of Gregor Mendel to the proceedings of a provincial society of natural history. Credit was given to Hugo de Vries alone for the discovery of the long-neglected contribution of the Abbott of Brünn.

If it is permitted me to make a correction and explanation, two other investigators, C. Correns and Erich Tschermak, presented papers to the German Botanical Society (*Deutsche botanische Gesellschaft*) in the early half of the same year, showing a familiarity with Mendel's work and extending and confirming his observations and deductions. Each author announced Mendel's priority, gave him credit and praised the fidelity of his observations, the unexcelled and unmistakable method of his analysis and the masterly presentation of his deductions.

Besides a few notes on natural science while he was a student in Vienna and three or four papers presented

to the local society on extraneous scientific subjects, Mendel's fame as an epoch-making observer and philosopher rests on a single article which he presented to the Academy of Sciences of Brünn on March 8, 1865, and published in the proceedings, vol. v, p. 1, 1866. This paper was about forty-four pages long, without illustration. The proceedings were exchanged with other learned societies and went into the libraries of the world, but the original is difficult to consult. However, a reprint has been issued which can easily be secured (Ostwald's *Klassiker der exakten Wissenschaft*, No. 121), and a translation made by Bateson (Mendel's Principles of Heredity, Cambridge University Press, 1909, 8vo, pp. 317-361, also Annual Report of Board of Regents of the Smithsonian Institution, 1902, pp. 557-580). It is possible to get an abstract and an illustrated presentation of Mendelism from J. Arthur Thompson's "Heredity" (1907), chapter x, p. 336. This book is in every public library. A very delightful little book by R. C. Punnet (Macmillan & Co., London, small octavo, pp. 85, about 50 cents) on Mendelism is particularly adapted to fanciers and naturalists who would like to verify the law.

The forty pages of observations covering eight years and the analyses and deductions which have changed the philosophy of the world, can be read in a few hours. The epoch-making experiments were conducted on the garden pea and within the enclosure of a monastery, by an isolated monk.

Only one author referred to Mendel's contribution from its publication in 1866 to its simultaneous dis-

covery by de Vries, Correns and Tschermak in March-June, 1900. Focke *Pflanzennischnge*, 1881, pp. 109-110) briefly and without appreciation mentions Mendel's work and compares it to Knight's.¹

We must, however, be grateful to Focke for this brief mention, for by so slight a thread were both de Vries and Correns, and possibly Tschermak guided to this important paper.

In this connection we must not fail to mention Peter, who, in 1884, the year of Mendel's death, referred in an article on hybridism in the *Botanische Jahresbücher*, vol. v, p. 201 *et seq.* and *esp.* 212, to Focke and twice to Mendel.

It is probable that other mention of Mendel's work will be found by readers, and it is more than likely that I have overlooked sources of information.

Mendel's disappointment at the silence with which his work was received was great if not bitter. He often asserted that his time would come yet. He went on with other experiments on bees and got queens from every part of the world. A few traditions among the monks and a few old beehives are all that is left to console us for what we believe we have lost.

In the early months of 1900 the knowledge of Mendelianism burst forth upon the world. The succession was about as follows:

On March 26 an abstract of some work showing the results of de Vries' work was presented to the Academy of Sciences of Paris by Gaston Bonnier (*Compt. rend.*, T. 130, pp. 842-847).

1 Libraries to which I have access do not have Focke's work, and my information comes from Bateson.

On March 14 de Vries presented to the *Deutsche botanische Gesellschaft* his complete paper, and he read the same at the meeting March 30, 1900. It was published in the *Bericht*, vol. 18, p. 83. In this paper he distinctly credits Mendel, and says that he was led to discovering Mendel's article by following Focke's reference (footnote on p. 85).

After reading de Vries' abstract in *Compt. rend.*, T. 130, Correns completed his article on a similar subject, in which he referred to Mendel and said distinctly that he ran down his article through Focke's reference, and, on April 22 he sent it to the German Botanical Society. It was received on April 24 and read at the meeting of April 27, and published in the *Bericht*, vol. 18, pp. 158-167. After its presentation Correns for the first time saw de Vries' complete article in the *Bericht* and learned for the first time that he was not the only discoverer of Mendel.

On June 2, 1900, Tschermak's article recounting his eight-year-long observations on garden peas was received by the society. He also discovered that de Vries and Correns had anticipated him, but as he had been several years in confirming Mendel's observation, he counted himself fortunate in his association with de Vries and Correns in the discovery of Mendel. His paper was presented at the meeting of June 29, and published on pp. 232-239 of the *Bericht der Deutsche botanische Gesellschaft*, vol. 18.

From 1862 onward hybridism and heredity had been prominent studies both among botanists and zoologists. How was it possible, then, for this simple,

brief, lucid exposition of a series of experiments with the garden pea to be hidden in forgetfulness and obscurity?

This romance or tragedy of science has given more pleasure in its pursuit than I can expect any reader will gain from its perusal, but I can only hope that the trail will be found lopped out so that the interested student may find fewer difficulties, though he may be robbed of some of the scout's pleasures.

The meager incidents of Mendel's life which have been made public have been briefly set down by Bateson. We hope for the resurrection of further material for a biography; for everyone is interested in the man who has so stirred the world of thought, made heredity a science, opened the door to a rational eugenics and rung the bell for a new social order.

BLESSED ARE THE MEEK, FOR THEY SHALL
INHERIT THE EARTH.

It was a shock to our complacency to learn through the press that Iowa had actually lost in population by the last census more than 7,000 inhabitants, and fallen from the tenth to the thirteenth rank in population. We had thought of Iowa as the ideal granger State. All of our hopes of rural life centered in this great commonwealth of unequalled natural resources and most fortuitous ethnic stock. The loss of 7,082 inhabitants or 0.3 per cent., without an earthquake or poor crops, or a visitation of locusts, or an invasion of disease, disturbed all our preconceived notions.

The further press report that more than one-seventh of the loss of population in the whole State was suffered by one county aroused the hope that it would be possible to discover the cause by giving especial attention to that locality. Wayne County therefore has attracted our attention, and we have made these studies, at a distance, to be sure, and still wish more direct information.

The population of Wayne County, fourteen townships, 528 square miles, was 17,491 at the 1900 census. Our present information shows that it has lost nearly 6 per cent. during the last ten years, and now numbers 16,184, a loss of 1,307 inhabitants. Almost every acre of land in the county is productive. It is on the Missouri boundary, half-way between the Mississippi and Missouri Rivers, on a sort of water-

shed. It was described by State Geologist Chas. A. White, in his first annual report (1868, pp. 40-42), in the most poetic and appreciative manner as the ideal rolling prairie of the State.

The first settler of the county was H. B. Duncan, who came up from Missouri in 1841, and was followed by sturdy Scotch pioneers in great numbers. In February, 1851, Dr. Isaac McCarty organized the county, and a bitter fight began over the location of the county seat, the bitterness of which still rankles in the breasts of the present inhabitants of rival cross-roads on the prairie. In 1852 the population of the county was 749; in 1860 it was 6,409; in 1870 it was 11,287; in 1880 it was 16,127; in 1890 it was 16,155; in 1900 it was 17,491, and in 1910 it had retrograded 1,307, and was 16,184. Even in 1880 there were only 454 persons of foreign nativity in the county and only 22 colored persons, which number fell to 15 in 1895. The proportion of males and females in 1880 was 1,000—965, and the proportion of adults to infants five years and under was above the average for the State. In 1895 the population of the county was 16,155, 50.7 per cent. adults, twenty-one and over, and 2,086 were five years and under, 12.2 per cent. At this time 51.9 per cent of the population of the State were adults over twenty-one years old, and only 23.72 per cent. ten years old and younger.

From the earliest times the people have been almost violently religious and sectarian, and the church has been a large element in the social life of the county—for good or evil. In 1855 there were five churches in

the county. In 1906 there was not a Catholic church and not a Catholic reported in the county, but there were 2,103 Methodists, 1,360 Campbellites (Disciples of Christ), and 1,128 Baptists. In Wayne County it means something to belong to one of these churches. All social and even material interests are influenced by the church. The marriages of conflicting church members or church members with outsiders is almost as serious an offense as miscegenation with the colored races. The results are marriages of cousins and others near of kin. All the Presbyterians, for example, are now related, by marriage at least, and the church becomes a social club which opens and closes its doors on economic opportunity.

Most of the farms are occupied by the owners or some member of the owner's family. Less than one-third of the farms are rented, and rarely then to strangers. The farms are not large, only one of more than 900 acres (Bracewell's). There have been very few transfers of real estate in the county during the last ten years. The reports as to indebtedness are not recent, but they show a fine condition and clear title in the present owners. There has been little emigration from the county to newer localities. The young people do not leave for the city as they do from many rural localities. They stay at home, and, since economic conditions do not prevent, they marry young, 21-24 for men and younger for women.—These marriages are fixed up by the dictates of agricultural propinquity, church membership and even consanguinity rather than by passion or love. Every now and then a couple

are married to legitimize an expected child, and the young people are separated at once if it is considered a misalliance and a divorce follows in due time.

In the whole State of Iowa divorces have greatly diminished during twenty years. There were 34,874 divorces in Iowa between 1887 and 1906, averaging about 2,300 a year at the beginning and 1,100 a year at the end of the twenty-year period. During the same time there were 242 divorces in Wayne County, about 15 a year at the beginning and 6 a year at the end of the period; to be exact, 8, 7, 6, 3 during the years 1903-1906.

Probably nothing is more difficult to get information about than the sexual and reproductive life of a people. There is no registration of vital statistics in Iowa or in Wayne County, so we can only take the testimony of the newspapers and medical men. It is our opinion that abortions are not habitual, and that the people do not generally practice maneuvers for the prevention of conception. We do know for a fact that many families consult physicians for means of securing impregnation, and that several curettements of the uterus have been performed with that end in view, as well as many less serious operations. A great many families are sterile when there is every reason to believe they are without venereal infection and were married young and have never practiced any methods designed to prevent conception. It is the opinion of one close observer that the Presbyterians are the most uniformly sterile and the Campbellites next. The

Methodists seem to her to be the most uniformly prolific.

There is one town in the county of 2,900 inhabitants and only a small floating population—few Jews, no negroes and no raw foreigners. Most of the inhabitants of the county, as in 1880, are native born and descended from the first pioneers of the 1850's—Scotch, English, American stock. A rather large proportion of the people are large blondes with broad heads, but a good minority are little brunettes with small heads, resembling the best brunette stock from the fastnesses of Scotland and Wales.

There are 13 dependents on the poor farm of 240 acres, and the county paid \$6,480 for the care of the insane last year.

There is little wheat raised in the county, but corn, oats and other grains exceed the average per acre of the State. A small part of the county, less than six square miles, are underlaid with coal measures.

The wells are usually open and fifteen to twenty-five feet deep, but there are some drilled wells getting pure water below the rock. The wells are close to the houses and barns, and rarely provided with windmills or gas engines for pumping. The farmhouses are entirely and, we believe, without exception, devoid of water closets, and only exceptionally provided with sinks. Many of these sinks are without outlets or inlets.

The houses are large, but not adapted to easy house-keeping and the arrangements are not such as to encourage social life by surrounding gardens, tennis

courts, garden-houses and shelters. In passing through this rich county one is struck by the lack of material evidences of culture as compared with far less prosperous regions in New England, England and Germany.

With such a water supply and such neglect of the refinements of country life it is not remarkable to hear that typhoid is endemic. It is no unusual occurrence for every member of a family to come down with typhoid fever without the slightest investigation by town, county or State officers of health. Any local physician who would question the potability of the water of the family well or the respectability of the ancient privy with its fly-breeding vault would not only lose practice in the family, but in the whole church to which that family was attached.

The after-effects of typhoid are also prevalent—sick headache, jaundice, colic and nervous disorders are the regular inheritance of most of the people in the fifties and sixties.

There are remarkably few cases of syphilis observed in the county. After each Chautauqua assembly the young doctors have a lot of gonorrhea to treat among the boys and girls about twenty, and a few patients have been operated on for pyosalpinx during the past five years.

If we are asked now why Wayne County has lost in population, we can only make a negative reply. The growth of population depends upon many factors and no simple answer is possible.

1. The loss of population is not due to alcohol, or vice, or poverty.

2. The loss of population is not due to the sterility of gonorrhea. (One-child families, so characteristic of gonorrhea, are extremely rare).

3. The loss of population is not due to emigration to the city or to new countries.

4. The loss of population is probably (in the face of no vital statistics) due to a falling birth-rate. (In the State of Iowa the birth-rate is low in 1900, as indicated by the percentage of children five years old and younger to the total population. Iowa was 11.8 per cent., the continental United States 12.1 per cent. We have no statistics from Wayne County.)

5. The loss of population is a rebuke to smuggling, orthodoxy, Yankeeism and American self-complacency. It shows how the inbreeding of a good stock under insanitary environment may deteriorate.

If we might suggest a remedy for this decadent community we would urge the establishment of schools of farmhouse hygiene, schools of country architecture, and gardening, schools of outdoor amusements, and schools of household decoration. The universities could easily spare the teachers from the candidates for the doctor's degree.

Wayne County has the natural resources and the sturdy stock. It has the freedom from the dangerous celestial and the disturbing negro, as well as freedom from the despised labor unions which many look upon as the curse of the city. What Wayne County needs is

ideals. The dry-rot of smuggery and self-complacency is making punk of this favored community.

The State of Iowa is in much the same condition. Of the ninety-nine counties only ten counties, all containing cities, have gained in population; the other eighty-nine have lost.

The question is, what are we going to do about it? The State of Iowa should be a veritable garden and a kindergarten. It remains true to the traditions of the last century, a prairie State. The towns grow, and even make progress in ideas and ideals, but the country languishes. The learned professions should take a hand in the regeneration of the stock that made the conquest of this continent a miracle.

PROFESSIONAL AND SURGICAL

THE COUNTRY DOCTOR AND TYPHOID.

NO DISEASE is better understood by American physicians than typhoid. It is a condition which is little influenced by medication, but marvelously modified by the watchful physician and the alert nurse. To the individual typhoid is a terrible calamity which has a high death-rate and a kaleidoscope of sequences which is a nightmare to contemplate. To the community typhoid is a disgrace which should call for as prompt and vigorous activity on the part of the sanitary officers of the police and constabulary show after a murder. The itch was exterminated by soap, cheap linen and single beds. It was a disease of the individual, or at least of the household. Typhoid is a community disease. The death-rate from typhoid has been almost entirely eliminated from our cities by the municipal water supply and the sanitary supervision of the milk supply. The small towns and the country are still disgraced by typhoid.

* * *

As the source of public opinion in matters of health we cannot remain silent on the typhoid question. Every typhoid patient should be treated as our science dictates (over which there is no dispute), and the occurrence of typhoid should arouse a hunt for the worse than murderous contagion that caused it. When the two man-eating lions stopped the railroad building in East Africa, they attacked and destroyed fewer men than are now at death's door in many a

county in this enlightened country. The further ravages of the disease could be stopped by less effort, with less danger and in a shorter time than it took to capture those two lions.

* * *

Diphtheria is conquered; wound infections are preventable; hospital gangrene is exterminated; tetanus is cornered and the terror of tuberculosis is much allayed; but typhoid, when once begun, must be carefully watched to the end. We know its cause, we have an exact method of diagnosis, but our only service and skill lies in exterminating, destroying, obliterating and even anticipating its source. Don't tell us that you save all or nearly all your typhoids. Tell us, however, that you found the source of infection in every case and that you succeeded in overcoming it before a second case appeared. When diphtheria shows itself in a family the patient is given a full dose of the antitoxin and each of the other members of the family an immunizing dose. The family is segregated from the public. No physician can hold himself guiltless when he fails to institute these precautions. A second typhoid in a family casts merited suspicion on the medical man who cared for the first case. The problem is not so obvious as our illustration above, but the logic is as binding. A succession of cases of typhoid ought to arouse activity in the medical society of the town, and the delinquent physician should be labored with and shown how greatly his neglect injures the credit,

honor and influence as well as the economic position of every member of our profession.

The pursuit of the source of typhoid infection is not so simple as to be devoid of interest. On the contrary it is one of the most complicated and fascinating studies which any physician can undertake. Our literature contains reports of the pursuit of typhoid infection as thrilling if not as adventurous as the hunt of the before-mentioned lions. The prescience of the "good old doctor" is of use in tracking the game through the mazes of modern industry and transportation. The well, the milk man and the much-neglected servant question are factors which must be considered and at last eliminated.

* * *

When the source of the disease is found there are, especially in the small community, many obstacles to the obliteration of the danger. If ignorance alone is in the way it can be slowly dispelled, but it is only too often attended by prejudice and stupidity. Then tact must be used and only as a last resort the sanitary police power brought in play. In no other emergency of practice, not in obstetrics, not in surgery, can the physician show himself such a diplomat and such a power as in filling up an old and long-cherished well or in remodeling or rebuilding a sloppy dairy. The well and the outhouse are the two great sources of typhoid in the rural community, and they should be put under ban as severe as the housebreaker and the highwayman.

* * *

With modern plumbing, which is not plumbing at all, but steamfitting and the driven well, the rural community ought to be as safe from typhoid as the city. The open well is a constant source of immeasurable danger, and in spite of years of innocuousness, it may at any moment, it must at some time, be a menace to life. The driven well is safe and permanent. Upon the whole it is cheap. Where it is not available, open wells are doubly dangerous. The State university provides advice for any particular locality in securing usable water and makes tests to confirm the suspicion of contamination or to refute it.

The abolition of open privies in rural districts is coming on rapidly by the dictate of fashion. The country is full of gasoline engines and windmills. Every farmhouse will soon have its water closet and bath room. The septic tank is particularly adapted to the purification of the sewage from a private house. The septic tank itself is under ground and not offensive. The overflow is clear, almost odorless and harmless. The whole apparatus is simple, cheap, permanent and reliable.

* * *

The physician should put his own house in order and make his surroundings a model for his neighborhood. In this effort he will learn the practical and realize his ideal. We never know until we do. Life is doing. The doctor should stand for communal co-operation in seeking a water supply and securing proper sewerage and garbage disposal. Nevertheless, until this co-operation is attained he should make his

own home and surroundings sanitary, convenient and attractive. Let him abolish the outhouse and install the water closet and septic tank. Let him do away with the open well and secure deep water through a driven well, a windmill, a gasoline engine or other device. Let him surround his house with a model garden and do away with the interminable rococo porch, the back door stoop and general untidiness of the average rural house. Let him also make his kitchen a model of convenience, cleanliness and permanence and the show room of the house. A house and yard inseparable, tidy, clean, compact and inviting, even if small, is an asset for a doctor which overcomes ignorance and superstition, Christian Science, the Emmanuel movement and every other form of irrational competition. It will keep him and his family at home. It will attract his friends and neighbors. It will be a model to his patients and an argument for following his precepts in thus raising the standard of his life. Typhoid will go when the abominations on which it lives are superseded.

THE SEPTIC TANK IN SEWERAGE DISPOSAL.

THE need of a higher standard of life is emphasized by the spread of the hookworm disease in the South and the ever-present typhoid in the North. It is left to John D. Rockefeller to call the sleeping masses to wake up to a condition which most of them never heard of before, that puts nearly two million Southern white out of the labor market. The standard of life of these people is so low that only about one-third of their residences have privies;¹ the remaining two-thirds have no provision for decency.

The condition of these poor whites is quite pitiable, but not more pitiable than a much greater number of residents in the North, who suffer from typhoid in ever-increasing epidemics.²

The savage lived in trees, or at least in the woods, and had little need to fear his own excrement. It was one of the least of his enemies. The barbarian nomad left his refuse and excrement to dry on the plains. To civilized man the disposal of his excrement marks his rise or fall. At first the household has no pro-

1 Public Health Reports, October 1, 1909, xxiv, No. 40.

2 The twelfth census of the United States gives 35,379 deaths from typhoid fever during the census year, or 35.4 per 1,000 deaths. The last English reports show that in England and Wales there were only 19.9 deaths of typhoid per 1,000 deaths from all causes. Typhoid is a communal filth disease, of which both guilty and innocent suffer, and it should be exterminated, and could be, as my readers already know.

vision for defecation. Then decency requires an outhouse. At last self-preservation requires the destruction of the fecal excrement. We are now in the throes of this last stage of development. In the cities of the United States most of the sewerage is dumped into the rivers, the lakes or the sea. Only rarely is an effort made to destroy the sewerage before it is cast abroad. The cities are now in about the same position communally as regards their neighbors as are two-thirds of the residences of the "poor whites" who have no privies.

Many methods of destroying sewerage have been tried, but none of them has equalled in efficiency, reliability and adaptability the method of the "septic tank." This is an unfortunate appellation. Septic has an ominous sound. Its associations are all unfriendly and dangerous. The "septic tank" is a great purifier, liquefier and sterilizer. It is equally well adapted to take care of the excrement of the city and of the country household, of the permanent population of peaceful countries and the moving armies of those engaged in war.

The fecal discharges of each individual may be considered to be about 300 grams (10 ounces) per day. They contain about 150 billion bacteria of more than fifty sorts. Only a portion of these are disease-producing. A large part of the bacteria are dead. They make up more than half the total mass.

The fecal discharges of man are far less advantageous to the soil as fertilizers than those of the herbivora or those of birds. In any large quantity

they are unmanageable. The feces, when dried and put on land become very offensive when wet. If they contain disease-producing life the moisture and warmth set the disease carriers loose and make the use of human excreta for gardens very dangerous. The hook worm, typhoid and some of the tapeworms are thus scattered and taken to new hosts by way of the vegetation on which they are carried to distant tables—on strawberries, radishes and other greens.

All methods of artificial sewerage destruction that are safe are too expensive to be practical.

The ordinary sewerage from a household of five people consists of 1,500 grams (50 ounces) of fecal matter, 5,000 c.c. of urine, and one hundred gallons, more or less, of water containing precipitated soap from the bath and much grease and detritus from the kitchen sink. The grease is the least perishable and the most troublesome to dispose of. Unless it is cooled and retained in some large tank near the sink it collects in the sewer and holds all sorts of detritus with it, and thus stops the drains and puts the whole sewerage system out of commission. Iron air-tight cooling and grease-collecting catch-basins are now procurable, and, placed near the kitchen sink, protect the system. They must be opened and the grease removed two or three times a year, depending on the care of the cook and the size of the catch-basin.

All the rest of the sewerage is perishable, and contains within itself all the elements of its own destruction and purification. It should be conducted into a water-tight fermentation tank, which should hold about

twice as much as the maximum daily output from the household. It should be not more than twenty-five to one hundred feet from the house, and connected with it by hermetically sealed pipes of glazed tile or iron. The catch-basin, the fermentation tank and these pipes should be kept freely open to the air by vents running above the roof or the surface of the ground. The septic tank and all drains should be below the frost line and wholly unconnected with the gutters from the roof or any other irregular flooding. Another distinct system should take care of the storm water.

The fermentation or septic tank should be about three feet deep and preferably longer than wide. The sewerage should enter into it at one end and somewhat below the middle of its height, and the exit should be at the opposite end and somewhat above the middle. These pipes should be not less than four or more than six inches in diameter and sealed water-tight into the ends of the water-tight buried septic tank. The outlet of the septic tank should rise until it is within a few inches of the top of the tank and then fall as fast as possible toward its outlet, thus keeping the tank full.

The operation of the septic tank is constant, uniform and automatic. The house sewerage flows in through a four-inch pipe, and therefore slowly, even when a bath-tub is emptied. All the solid material rolls slowly out and sinks to the bottom of the tank at once. The liquids, according to their specific gravity, rise to the top or sink to the bottom. Some of the fluid flows slowly out at the exit at the opposite

end of the tank. The contents of the septic tank are never agitated.

The flora of the septic tank soon becomes established. The struggle to exist results in the consumption of almost every particle of solid matter and the production of soluble inorganic substances. A very thin film of aërobic micro-organisms is generally present, and their preservation is attained by keeping the outlet below the surface of the tank. The sewerage which flows out of the septic tank is slightly turbid water of a specific gravity less than that of urine. It is almost without odor, and it contains few if any living pathologic micro-organisms. It can be discharged into an open ditch without producing offense, and can be collected into a pond which remains perfectly clear, summer and winter. If discharged into a small run or brook it will not kill the fish or pollute the stream. It can be discharged into drainage tile without befouling them or putting them out of service. It can be discharged into sandy soil by letting the end of the outlet pipe open under ground into a hole filled with stone or coarse gravel.

For the village or city the septic tank is equally serviceable. One may be constructed by each individual, but better collectively, one for each block, with a single outlet into the sewer in the street. If Chicago had a septic tank in each block the drainage canal and the Illinois River would run clear.

RESUME.

1. The privy marks the first step from barbarism into civilization; the water-closet marks the next.

2. The connection of the water-closets with street sewers is unnecessary, and direct connection and the pouring out of undestroyed sewerage into the street drain is undesirable and dangerous.

3. The septic tank is an efficient, simple, automatic and economical method of destroying and rendering inert house sewerage. It is cheap, clean and practical.

4. Every house that has a chimney ought to have a water-closet, and every water-closet ought to be connected with a septic tank.

THE DUTY OF RAISING THE STANDARD OF RURAL LIFE.

It is axiomatic that the physician is a citizen. He has special privileges and unusual duties. As one who is called to learning, he should lead in all cultural activities. He should have a special care of all matters pertaining to the social, physical and moral health of his community. But he ought to be greater than his profession and take the broadest view of the social needs.

In the recent inquiry into the conditions of rural life, undertaken as a part of the inventory of our national resources initiated by Theodore Roosevelt, many significant facts have developed. The general dissatisfaction of the younger generation with farm life is the most pregnant of evils. The boys and girls would, and do as far as possible, leave the farm. The cities are overrun with the youth of the country.

In asking many young men and women who have good country homes and considerable financial resources, why they come to the city, they almost invariably express their distaste for the low standard of life on the farm as compared with that of the lowest clerk in the city or large town.

Our farmers dress as well as the tradesmen in the city. The farmers' wives and children dress as well as those of the tradesmen. So far farm life presents as high a standard as town or city life. Differences in taste and financial expenditure alone make differences,

especially in the dress of women. The farm-house has not kept up with the housewife's apparel. The country house of to-day does not compare favorably with that of fifty years ago. It is heated with hard coal stoves, with steam or with hot water, but it is small, close, stuffy, and artistically terrible, externally and internally. It is lighted with lamps instead of candles, or with some of the terrible mantle illuminators, but the means of making the kitchen and laundry work easy, clean and dignified are for the most part wanting. The kitchen is still a scullery. The laundry, if there is one, is not connected with the gasoline engine which runs the dairy or grinds the feed in the barn. The chambers may be ever so hot with steam or hot water, but the toilet and bathing necessities of a city house are absent. In the matter of housing, whether we consider it from a hygienic, a social or an artistic standpoint, the farm-house is woefully below the standard for the city. The surroundings, too, of the farm-house are utterly neglected. I lately examined the surroundings of a long line of farm-houses where the surrounding land was selling at more than two hundred dollars an acre. Some of them had beautiful trees about, but not one in twenty showed any care or pride in the surroundings, and no effort at what might have been realized in the way of a garden. Our people do not seem to know what a garden is. They sometimes have kitchen or vegetable gardens, though I must say rarely, and now and then a few flowers in beds, which is termed a flower garden; but to have such an arrangement of the vicinage of the

house as leads to the gradual extension of the residence from the walled rooms to the lawn, the arbor, the tennis grounds or belvidere, is practically unknown among farmers. This condition is not due to lack of resources, but to lack of taste. It is a condition of as much importance in maintaining the population of the country as the location of the well or the proper feeding of the babies. The simplest farmhouse may be surrounded by a garden which will at once be a joy to every resident and visitor, and give health, contentment and inspiration to every one who is fortunate enough to have entry to it.

The first doctor I ever knew intimately was a farmer in Elmira, Stark County, Illinois. He lived in a large house, surrounded by a large, old-fashioned garden. Near by he had a nursery of forest and shade-trees. It was the most interesting home I have ever found a doctor living in and dying in. He had a beautiful family, and I believe no one of his many children has failed to honor that home. This man's work was done among farmers, and he added to the resources of the State by his observations on the diseases of farm crops, farm animals and forest trees quite as much as he added to the comfort and health of his patients by equally scientific treatment and friendly counsel.

The times have changed. Every State now has an agricultural experiment station, and the farmers read the bulletins of the Department of Agriculture, and are alive to selecting seed and sowing nitrogen-producing bacteria. Farming as a trade is well in the hand of

the farmer, and he makes it pay; but farming as a profession or calling is neglected, and in this sense the American farmer is the greatest failure. The more successful he is in making money the more surely will his children leave the farm for the city, for the town or become commercial travelers.

In a number of farmhouses surrounded with barns and equipped with the machinery of cultivating, planting, harvesting, feeding and marketing, the piano and piano-player, the graphophone, and every means of culture which the best books and pictures can give, have failed to induce the young people to follow the paternal occupation. The cause cannot be placed in the lower standard of life in these particular families. It may be looked for in uncongenial neighbors or in faulty education. The standard of life, to effect anything, must be communal rather than family or individual. The whole of rural life must be idealized. Farming must not be a trade for profit, but a vocation for life. The farm must not be looked upon as "a plant," but as "a home."

One of the most subtle influences in our rural life, distracting the minds and hearts of our children from the farm, is the so-called educational system. The schools teach a certain lingo which is termed the curriculum, conceived without regard to the child's body, mind, soul, or environment, and perpetrated without feeling or sympathy by immature or inexperienced spinsters, in cheerless, church-like surroundings. The country district school is a stepping-stone only to the town school, and that to the city school, and thus

from the beginning inevitably from the farm. The education of the district school educates from the farm, and in this significance alone is educational. Not one single hour in a whole year's schooling is devoted to idealizing farm life. The very attitude of curriculum, administration and teacher disparages the farm. The district school-house should be architecturally an honest and interesting building. It should be artistically well furnished and decorated. The teachers or teacher should be of the rural class and be proud of living on the land. He should teach the boys to honor their fathers, and she should teach the girls to honor their mothers. The surroundings of the school-house should be ideal and idealized. The occupations of the farm should furnish the basis of the curriculum. It should not be a trade school, but a school in which the activities of the farm are systematically taught. It should not be exactly manual training or sloyd, but based on the ideals of the best in both.

It is evident that our poorly supported district schools could not undertake, each of them, such a program. It would be necessary for them to combine and transport the children to the central or township school, and there provide the gardens, green-houses, shops and machinery necessary to such an education as benefits children who are to live on the farm. The normal school would need to be equally revived and brought to the life of the people for whom their training is intended. The normal school will then be closer to the

schools of agriculture and sociology than to the schools of Latin and belles-lettres than they are to-day.

The youth of our land want association and excitement, and for these they go to the city. The former would be encouraged by good roads and by the inevitable extension of the trolley and automobile. The excitement should be furnished at home. Sports should be encouraged in the country as they are in the city. The time spent in games and in endurance tests and tests of skill is not time wasted when farming is conducted for life instead of for profit. The ceremonial forms also occupy too small a part of life. Festivals, celebrations, fetes and other social congregations should form a growing part of country life. The pride of occupation, of local undertaking and achievement, as well as of national or social aspiration, should be encouraged by pageants and processions.

In bringing about a conscious development of a higher standard of rural life, the country doctor is privileged to take an enviable part. He may by example show what may be done in making the home convenient, comfortable and inviting. He may demonstrate the labor-saving and life-saving decencies of the city house as applied under local rural surroundings. He may less easily than the farmer extend his residence into a garden. In the school, also, he may be helpful, and bring the merchant class of the village and towns to see their interest in promoting a self-respecting, permanent rural community. It is likely that the trade of such a community would not only be more profitable to the village tradespeople, but would

be easier to retain and handle, and easier to keep away from the mail-order houses and migratory "department stores."

It is possible that an active part in such a social movement would restore the doctor to that leading place in the community which we must all admit he fails to inherit from his ancestor of fifty years ago.

BLESS THE COOK.

EXCEPT in actual disease and even in most diseases the cook, the good cook at least, can be relied upon to furnish the best diet. It is a terrible state of mind when a person, sick or well, disregards the scriptural injunction so far as to take thought even to-day of what he shall eat and what he shall drink. In certain sanitariums little else is talked about than this or that diet and this or that condition of the natural functions of the body. The result is a chronic communal state of hypochondria. In some of these places the poetic hyperbole of Channing has literally come true: "The hypochondriac, shrinking from every breeze, weighing his food and fearing exhaustion from fatigue, loses all animation." The scales are on the table and the food is not only weighed, but its value in calories is added up to complete the meal or feed.

It seems to me that the modern tendency for every man to become his own doctor is most productive of an abnormal state of mind and body. Better that every man were his own lawyer, his own electrician, his own plumber, his own engineer. The constant direction of the mind, especially of the young and the idle, to the functions of living, especially to eating and drinking, upsets the intellect. The subtle intropulsion of the attention by so otherwise harmless a fad as Fletcherism has begun a course of hypochondria which a dozen Emmanuel movements cannot efface. The healthy stomach becomes incompetent and sick when

it is supplied with an insufficient or monotonous diet, and after that the man is sick. (By stomach is here meant the whole digestive apparatus). The most terrible and obstinate case of scurvy the writer ever saw in an adult was not in corralled laborers under contract, but in a man who voluntarily followed too closely his medico-sacerdotal leader.

Irreparable damage has been done thousands of children by cocksure physicians who have attempted to prescribe an artificial diet for babies they wisely or unwisely removed from the breast. Conditions, less serious at the outset than the toxemia known as cholera infantum, have been fixed upon the helpless victim for life.

The present study of diet is based on so imperfect a physiologic and chemic basis that it must be applied *cum grano salis*. The function of the physician is to stand between his patient and uncorrected scientific indications. In nothing is this more true than in diet. Whatever diet you prescribe, let it be for a definite and rather short time. Then let the patient eat what is set before him and ask no questions.

Each people have a diet which unthinking experience has balanced up to the mean physiologic requirement. When traveling, therefore, it is best to follow the custom of the table at which you find yourself sitting rather than undertake to live as you do at home. The Italian cuisine needs wine, the German beer and the Chinese tea. It may be that each of these menus is eccentric and produces corresponding national traits and tempers, but each is better than anything an indi-

vidual away from home can command, even though the Sultan of Sokoto or the Mandarin of Ho Nan with suite.

Many things that custom irrationally dictates, science adequately elucidates and explains. Take the table of any family where the mother is "a good cook." Notice the almost perfect division, or better, assembling of the meal. The live and cooked foods; the solids and the liquids; the hydrocarbons, the albuminoids and the fats; the nourishing, the residual and the stimulating, and the hot and the cold; what chemist can equal it?

It is doubtful if any internist would undertake to devise three meals a day for a table of five and keep it up for six years, with due consideration for stress of weather and exigencies of the market. Certainly no instructions given in the office to relatively healthy persons can do more than upset the cook's empirical program.



JAUNDICE IN THE NEW-BORN.

THERE is no symptom more ominous to the parents and the physician alike, which the infant is apt to manifest than jaundice. In the great number of cases this symptom passes off in a few hours, and is due probably to the traumatism of birth acting upon the largest gland in the body. The jaundice, which comes on later, and is associated with infection of the cord, is common enough to give rise to the popular terror which this symptom excites.

There are, however, a number of conditions in which jaundice of the new-born appears that are of sufficient frequency and pathological significance to be worthy of discussion. In some of these cases, terminating in death in the course of a few weeks or a few months, there is a congenital absence or impervious deformity of a considerable part of the biliary tract, the common duct and the gall-bladder, the cystic duct, or a small portion of the common or hepatic ducts.

In 1886 Geissner presented a thesis to the University of Halle on "The Congenital Obliteration or Absence of the Common Duct," and thus called the attention of pathologists and physicians to the subject. John Thompson, in several communications and in his exhaustive article on "Congenital Obliterations of the Bile-Ducts," in Allbutt's "System of Medicine," greatly elucidated the subject. He has utilized the experience of obstetricians and patholo-

gists, and shown that the condition is one that merits consideration, both from a medical and from a pathological standpoint. Generally the cases are isolated, but in a few instances they have appeared in twins or in two or three members of the same family. In some instances the parents have been shown to be syphilitic, and it is believed that with the use of the Wassermann reaction a more absolute diagnosis can be made, and thus a recurrence at a subsequent pregnancy can, by suitable therapy, be effectually prevented. In a great number of cases the parents have manifested evidence of hereditary syphilis. Some of the parents were simply under-nourished, and nearly all the mothers complained of stomach trouble or suffered with severe nutritional disturbance.

About one-fourth the infants themselves were jaundiced at birth, and the rest became so in the first few days of life. In a considerable number of cases there was a discharge of normally colored meconium which at the next movement of the bowels was followed by colorless feces having a very offensive odor. Other cases seemed perfectly normal in all respects for a few days, then jaundice and clay-colored stools appeared. Coincident with the appearance of the jaundice and the clay-colored stools, bile appeared in the urine. The great bulk of the cases showed hemorrhagic tendencies from the first, and many died from umbilical or from intestinal hemorrhage. It would be worth while to secure an autopsy and an examination of the common duct in all cases of death from umbilical bleeding. The liver and spleen uni-

formly enlarged if the child lived long enough. Most often the child died inside of six weeks, but some lived as many months. They became terribly emaciated, bleeding or blebs appeared, and they suffered of accidental terminal diseases or died of exhaustion.

Thompson could find only sixty cases reported in the literature, many very incompletely. The authors reported the obliteration of the duct as due, in their opinion, to various causes; namely, to congenital defect, to syphilis, or to injury or infection before, during or immediately after birth.

It is certain that obliteration or absence of the biliary tracts occur in fetuses where there are extensive congenital arrests of development. (Wetzel, *Zentralblatt f. Gyn.*, 1880, p. 561.)

A presumptively healthy condition of the child at birth does not preclude isolated congenital error in the bile tracts, for other more serious errors are found in apparently well children.

It is difficult to make the diagnosis without an autopsy, but in the more recently reported cases the diagnosis of syphilis was indubitable. The therapeutic diagnosis has been made in several by the use of anti-syphilitic remedies. One observation, where twins were thus treated after the diagnosis of syphilitic obstruction of the common duct was made, the rare fortune of an autopsy on one twin, and the recovery of the other followed. When we consider that patients recovered under mercurial treatment that presented the gravest symptoms, this observation was almost as good as an autopsy *in vivo*.

The fact that some of the patients appeared to be well and then became sick, seems to make gastrointestinal infection a possible cause; but none of the histories were given in which this factor was made out. Enteritis appears as a secondary symptom in all the cases that lived long enough to manifest it.

Boys are affected more often than girls—three to two. Only one of Thompson's cases was stillborn. Eleven lived less than a week, eight more than a week but less than a month, fourteen one to four months, sixteen four months to eight months, and two more than eight months.

From a surgical standpoint, the demonstration of these serious and scarcely viable conditions of the biliary tract carry a serious lesson. Such extensive lesions occurring so infrequently must, by the law of chance, be attended by less serious lesions occurring far more frequently. These children live and reach maturity exposed in a greater degree than perfectly formed individuals to the dangers of infection of the biliary tract. Any syphilitic stenosis or congenital deformity of the common duct would delay the passage of infection or calculi, and thus precipitate a condition requiring surgical relief under circumstances which would not eventuate in the well-formed. The cystic duct itself is sufficiently complicated without the possibility of a malformation or defect of a congenital nature. The part which congenital malformation plays in the production of cholecystitis has, for obvious reasons, never been demonstrated. The analogy of this tortuous canal to the Fallopian tube,

to the appendix, to the ureter and to the ducts of the sweat glands, has required us to consider it, but the possibility of syphilis has not received much attention in the etiology of cholelithiasis. The facility and positive nature of the Wassermann test ought to furnish new light in a large number of cases where infectious cholecystitis comes up for diagnostic consideration or surgical treatment.

DEATH FROM ACAPNIA.

ONCE in a while medical literature is presented in such a form as to fulfill all the requirements of a contribution to science, a masterpiece of literary art, and a good newspaper story. Such seems to us to be the recent article by Yandell Henderson, entitled "Fatal Apnoea and the Shock Problem." (*Bulletin of the Johns Hopkins Hospital*, vol. 2, p. 236.)

The surgeon is conspicuously conservative and essentially conventional. He fixes upon a ceremonial and insists upon a routine. These ceremonials he is loathe to break through. Now and then changes become inevitable, but the very difficulty of their initiation secures them a recognized position.

Anesthesia fought its way into the operating room and then began the unfinished and inexorable contention between anesthetists for a monopoly of material and method. No single detail is so much the despair of the operator as the anesthetic. No other office is beset with so many intractable and uncomputable variables. If an operator could trust his anesthesia he could undertake with composure and complacency the most desperate surgical adventures.

Now comes Mosso before the surgical court with a new word, akapnia (*a-kapnos*, without smoke), and a new cause of death. Hereafter this word must be a conspicuous danger flag in every operating room, and a *bete noir* to every anesthetizer. The traditions of the anesthetizer's table are broken in upon once more.

With the departure of the ever-ready hypodermic of strychnine must go, if Henderson's article is read, the tank of *pure* oxygen.

In a most charming manner the Yale professor tells the story of death from carbon dioxide starvation. Our junk-pile of physiologic theories occasionally furnishes a sprocket or cam that fits for the requirements of the vital mechanism. The theory of the excitation of the center of respiration by CO_2 is one of these. If from any cause the CO_2 falls below a certain proportion in the blood, that center is sparkless, fails to act and respiration ceases.

A man suffers a crushing injury of the hand. Pain causes unusual, excessive and rapid respiration. The carbonic acid gas disappears from the blood. When the patient's pain is relieved by time, by morphine or by a general anesthetic and the peripheral irritation due to the injury fails to excite the respiratory center, the act of respiration ceases, the breathing stops. The heart continues to beat and the blood pressure is still high for quite a time—eight to fifteen minutes. Then the countenance becomes blue and turgid, the heart stops and the man is dead—dead for the lack of carbon dioxide—dead from acapnia.

If in such a case the blood is examined for its contained gases, it will be found deficient in CO_2 , below the amount necessary to excite the respiratory center. The circulation of the blood after the cessation of respiration, which continued for eight minutes or more, did not generate enough CO_2 to bring this fluid to a CO_2 concentration at which it could stimulate the res-

piratory center to a renewal of respiration. Could one have aroused this center to activity by peripheral irritation (stretching of the anal sphincter?) or by injecting some carbonized normal salt solution or other fluid rich in CO_2 into the circulation, the man might have lived.

Hyperpnea has a most unexpected termination. The CO_2 in the blood is normally twice as abundant as the O_2 volume for volume. In forced respiration the CO_2 disappears below the point of exciting the respiratory center before the hyper-oxidation produces recognizable symptoms. If a person is in a clean atmosphere and has the determination and physical endurance to continue forced respiration and inspiration long enough we conceive he can become physically exhausted and then having stopped forced respiration, automatic respiration will not be resumed because of his condition of acapnia, and in the state of perfect ecstasy and comfort which this condition produces, he will die at the end of ten or fifteen minutes, asphyxiated, without the slightest sensation of lack of air or the slightest effort at respiration. From all that we personally know of the sensation of the acapnic state (including our own ancient forty bottles of sarsaparilla before breakfast in the morning) such a procedure could be recommended to every suicide club as a pleasant method of taking off.

The patient struggling under the first anesthetic becomes acapnic before he becomes unconscious. With his unconsciousness the respiratory stimulus of peripheral irritation and mental excitation disappear. His

blood has already through hyperpnea become deficient in CO_2 , and therefore he stops breathing, and, in spite of every effort of the anesthetizer, he makes no effort at respiration until the CO_2 has been restored to a working minimum. How often we heard the anesthetizer give the alarm that the patient had stopped breathing; how many times have we left our operation, if already begun, and joined in the desperate efforts to produce artificial respiration, ignorant of the fact that we were aggravating an already intangible acapnia. In the days of the dirty old rubber bags that our enthusiastic anesthetizers once used over their ether cones these accidents were rare. Possibly those bags promoted pneumonia, but they prevented acapnia. Henderson recommends that we have paper bags to cover the ether cone when we are anesthetizing an irritable or excited patient in order that he may breathe over and over again the atmosphere burdened with CO_2 , and thereby avoid acapnia. He further suggests that when during anesthesia respirations have stopped and the blood pressure has not yet fallen in shock, that the operating room be provided with oxygen in which 5 or 6 per cent. of CO_2 has been mixed and that artificial respiration of this mixture be induced by introducing a catheter into the larynx down to the bifurcation of the trachea. Thus a measured portion of the mixed gases could be given until a sufficient amount of CO_2 stimulation is reached and the respiratory center again takes on its function.

In case of hyperpnea from injury or distress, the patient should be smothered either by the application

of a paper bag over the nose and mouth or some other available material, and the pain be as quickly as possible relieved.

"No idea," says Henderson, "is more firmly fixed in the medical mind than the erroneous notion that the respiratory center is sensitive to alterations in its oxygen supply," and we may say that nothing is more shocking to the complacency of the surgeon and anesthetizer than the intellectual discovery that a patient may die with an abnormally small content of CO_2 in the blood, and yet really die of an oxygen starvation without the slightest hope of benefit from more air or more oxygen.

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